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Section of Public Health, Tuberculosis, Tropical Medicine and Industrial Medicine.[1]

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Honorary Secretary: D. Gordon, M.B., B.S., Queensland.

President's Address.

DR. D. R. W. COWAN (Adelaide) took as the subject of his presidential address "The Role of the Voluntary Worker in the Control of Tuberculosis". He referred to the steps taken at the Perth congress to establish an Australian Tuberculosis Association, and he recalled the fact that in speaking to the subject on that occasion he had quoted a statement by William Osler that by "joining actively in the work of local and national anti-tuberculosis societies" medical practitioners could help in the most important and most hopeful campaign ever undertaken by the profession. Gratifying progress had been made with the Australian Tuberculosis Association; voluntary associations had been formed in four States. Queensland and Tasmania had so far done nothing. It was for this reason that Dr. Cowan had chosen his subject. It only required some ardent soul to give a lead and the rest would follow without much trouble. Perhaps an isolated individual could do little, but joined to others in an association, he might be able to accomplish much. Voluntary associations would not embarrass official efforts; the best results would be obtained by a combination of both. All that governments could do was to formulate plans, to provide money and facilities, and to give a lead. Without the help of the medical profession and the people a government could not make its plans effective. Though governments had done much, they had left much undone; they would go on leaving it undone unless urged on by the force of public opinion. Dr. Cowan referred to the report of Dr. M. J. Holmes in 1927 and said that nothing had come of it. Many recommendations had been made by the Tuberculosis Subcommittee of the National Health and Medical Research Council, but none of them had been implemented. A well-

[1] The meetings held by the Section of Public Health, Tuberculosis, Tropical Medicine and Industrial Medicine with the Section of Pathology and with the Section of Radiology and Radiotherapy and the Section of Medicine have been recorded.

informed public opinion was the best possible stimulus to political activity. Voluntary associations could, if need be, ascertain and publish facts; there was plenty of scope for education of the people by voluntary associations. Voluntary associations should not, except in rare circumstances, enter the fields of diagnosis, treatment and economic relief, which were better left to official agencies. They might play a part, however, in prevention, in after care and in rehabilitation. In conclusion, Dr. Cowan referred to what was being done in the voluntary sphere in some other countries, and said that with confidence in themselves, with enthusiasm, Australians could do the same and make the Australian Tuberculosis Association a power for good.

Tuberculin in Diagnosis and Treatment.

DR. F. GUY GRIFFITHS (Sydney) discussed the use of tuberculin in diagnosis and treatment, which was based on Koch's phenomenon. He said that in diagnosis "Old Tuberculin" was used, or better, "T.A.F." or "P.P.D.", which were free of protein and albumose. On cells made sensitive by tuberculous infection it acted as an antigen and stimulated a specific response, the production of antibodies, whose effect was observable. There were five methods of application: (*a*) the original subcutaneous method, (*b*) the conjunctival method, (*c*) the percutaneous method, (*d*) the intracutaneous method, (*e*) application by ointment or plaster (patch). If the subcutaneous method was used, it should not be applied to febrile patients (especially not in the presence of meningitis), the tuberculin should be used in fresh dilution, and aseptic precautions should be observed. A local reaction at the site of injection showed that the patient had been infected with tuberculosis, a general reaction indicated active infection, and a focal reaction showed where in the body the tuberculous infection was. There would be no reaction if the patient was too ill, or if tolerance had been established by tuberculin treatment. Successive doses at an interval of two days would increase sensitivity. The clinician should beware of the presence of another disease as well as tuberculosis. The reaction was now admitted to be specific; but it was not held to be absolutely certain. As in other diseases, all ancillary methods of diagnosis should be used.

Referring to treatment with tuberculin, Dr. Griffiths recalled the warnings against its indiscriminate use given by Koch and by Wilkinson. There were many kinds of tuberculin; "Old Tuberculin" should not be used. The object of treatment was to evoke active immunity. Treatment was easiest in early cases, in which supersensitiveness was usually present; it was difficult, often impossible, in late cases, especially in mixed infections; tuberculin was specific; it was useless against organisms other than *Mycobacterium tuberculosis*. Tuberculin treatment required some reserve strength in the patient. Healing was by fibrosis; there was no regrowth of the destroyed lung parenchyma. The dose should be cautiously increased, by 40% or less, at intervals of three or four days or more. The reaction stimulated the *vis medicatrix naturæ*, and evoked immunity against tuberculin, and to a less extent, against tuberculosis. Slight reactions did good; a cautious increasing of the dose decreased sensitiveness. Large doses were required for prolonged good effect; immunity, complete or partial, faded, and a renewed course of treatment was often required. No claim was made for invariable success. "Old Tuberculin" would not produce immunity against tuberculosis in those having no tuberculous infection; that was reserved for such preparations as bacillary emulsion and *Bacille Calmette-Guérin*. Some authorities considered that tuberculin could be used as a general tonic, especially for previously treated patients, and some held that its action in asthma was "meta-specific".

DR. L. BEDFORD ELWELL (Brisbane), in opening the discussion, said that Dr. Griffiths's interest in tuberculin had been first aroused, as had his own, by Camac Wilkinson, the pioneer of tuberculin treatment in Australia. By using tuberculin whenever it could be used with advantage throughout one's professional life, one should be in a good position to assess its value. Dr. Elwell referred to the high opinion of tuberculin therapy held by Dr. Pottenger, Emeritus Professor of Medicine, University of Southern California, and stated in his recent text-book on tuberculosis, and by the late Sir Robert Philip, Professor of Tuberculosis at the University of Edinburgh.

Dr. Elwell said that from his own more modest experience of a fairly extensive and consistent use of tuberculin for over thirty years, he could emphatically endorse its value. He had used it largely in pulmonary tuberculosis, both early and advanced, much more frequently the latter, and also in many cases of tuberculous glands, in several cases of Addison's disease and in a number of cases of uro-genital tuberculosis. He could also quote instances of complete and lasting success in conditions for which there was no other remedy—for example, in recurrent hæmorrhages into the vitreous, said to be due to tuberculous phlebitis of the retinal veins, and in tuberculosis of a single kidney following removal of the other. He had seen tuberculids of the skin, which had been progressively developing for as long as eight years, steadily resolve under the influence of tuberculin therapy. It was noteworthy that such patients might consider that they were enjoying reasonably good health, but soon discovered that their health could be much improved after a course of tuberculin. That observation emphasized the systemic nature of tuberculosis in all cases, no matter where the presenting lesion might be, and that was where the great value of tuberculin lay, with its essentially systemic action.

Dr. Elwell went on to say that in tuberculosis of the mucous membranes, the mouth, the fauces and the larynx, in tracheo-bronchial ulceration and in intestinal tuberculosis, streptomycin should be used; but it was always best used in conjunction with tuberculin, which could make good some of the defects of streptomycin. Moreover, streptomycin would always be indicated in the acute febrile caseo-pneumonic form of the disease; but tuberculin would again be needed as soon as the patient became afebrile. The American Trudeau Research report (1949) had suggested that streptomycin was not so useful in confluent and rapidly caseating and liquefying tuberculous pneumonia. Dr. Elwell had recently used it in conjunction with tuberculin in treating a young girl, the subject of an acute caseo-pneumonic condition with multiple cavitation, with eminently satisfactory results after less than six months' treatment. The Trudeau report had stated that streptomycin interfered with growth and multiplication of sensitive strains of *Mycobacterium tuberculosis*, and that it apparently did not directly enhance tissue repair, though it probably influenced its *tempo* and quality through action on the tubercle bacilli. Consequently tuberculin was indicated in conjunction with or after streptomycin therapy, or at both times, because according to Pottenger it stimulated the healing process and desensitized the patient's fixed cells so that he would not react so violently, even should he be required to withstand very large doses of bacillary protein. One of the chief effects of the natural bacillary protein in tuberculosis was to act parenterally and to stimulate fixed cells and the reticulo-endothelial system to form specific enzymes or antibodies, which would destroy bacilli and bacillary protein in the increasing amounts in which they were found in the tissues in advancing disease. Pottenger went on to say that tuberculin had the same antigenic effect, and that when given in increasing doses it stimulated the cells to produce more enzymes or antibodies; at the same time it reduced the supersensitive reaction at the surface of the fixed cells, and so lowered the inflammatory reaction and the tendency to produce necrosis and liquefaction of tissues, while stimulating the formation of fibrous tissue and promoting healing.

Dr. Elwell finally said that with regard to administration, he was in accord with Pottenger's statement that there was a technique in the administration of tuberculin which was just as important as the technique of a surgical operation; it could be learned best by seeing patients treated by someone who understood its administration and following them through to the completion of their healing.

DR. ERNEST SILBERSTERN (Westwood, Queensland) expressed the view that all tuberculin could be very beneficial if correctly applied, and very dangerous if not, and it was

unfortunate that failures due to incorrect application had brought it undeservedly into disrepute. Its use could not be learnt from text-books, but by personal instruction and experience only, and he considered correct selection of suitable cases and detailed, frequent and exact control of the reactions to be important. "Old Tuberculin" given subcutaneously for diagnostic purposes could cause unfavourable reactions in tuberculous lesions in organs where the disease was not suspected and in lesions in which an unsuitable concentration of "Old Tuberculin" had been used. He therefore preferred intracutaneous injections for diagnostic purposes followed later by graduated subcutaneous injections for treatment. He was of the opinion that the existence of humoral antibodies in addition to cellular antibodies was proved by the demonstration of procutins and anticutins by Loewenstein, Jadassohn and Martenstein, Frisch and Silberstern.

DR. DOUGLAS ANDERSON (Sydney) said that he was one of the sceptics in regard to the value of tuberculin. Although Dr. Griffiths had told the audience what it was and how it acted, to him (Dr. Anderson) supersensitiveness in any one individual to the tubercle bacillus or any other allergen was a variable quantity, and he believed that it varied with anxiety, contentment, happiness or unhappiness, stress or tranquillity. Dr. Anderson thought that if one could influence that state in the individual—both his humours and his cells—one could influence his reaction to the tubercle bacillus in more sure ways than by such artificial methods as the injection of tuberculin. He knew that the advocates of tuberculin treatment were men with as much wisdom as those who opposed it; but he felt that as much could be accomplished without tuberculin as with it.

DR. A. H. PENINGTON (Melbourne) thought that many of the hypotheses about the action of tuberculin were based on false premises, and what was now termed allergy was not the allergy of Koch. Koch's réaction was a delayed, not an immediate, reaction and, unlike a true allergy, could not be transferred by the serum of a sensitized subject to an unsensitized subject. As Dr. Griffiths had pointed out, the allergic reaction in tuberculosis was a cellular reaction and the vascular reactions of sensitiveness in that disease were not the vascular reactions of allergy. Dr. Penington thought that tuberculin was a preparation of which little was known, and that equally good results could be obtained with bed rest and newer methods of treatment. He believed that as tuberculin was unsafe and the results did not justify its use, it should be abandoned.

DR. D. R. W. COWAN (Adelaide) said that he was not interested in theoretical considerations, but he was interested in his own personal experience; he had seen results from the use of tuberculin that were convincing. He had gone through the stage at which it had been said that the use of tuberculin as a diagnostic agent was useless, as everybody had tuberculosis, and had lived to see the day when the use of tuberculin in diagnosis was universal. He thought that tuberculin should be used for elderly patients with quiescent lesions, and streptomycin and "P.A.S." for the patient with a recent infection. Dr. Cowan had vivid memories of a patient with tuberculous hip disease treated in bed for two years and going down hill, whose condition, with no variation in treatment beyond the administration of tuberculin, had within four months improved out of sight; sinuses had dried up and an associated ulcer of the leg had healed. He could quote equally impressive results in tuberculosis of the eye and of the genito-urinary system. Dr. Cowan maintained that experience was the greatest teacher, and that in properly selected cases tuberculin was of great value.

Dr. Griffiths, in reply, emphasized the importance of the proper selection of patients for treatment with tuberculin, but said that there were many occasions when, through economic conditions and other factors, such as shortage of bed accommodation, patients had to be treated as out-patients; even in the treatment of such unselected patients under bad conditions, good results followed the use of tuberculin. Dr. Griffiths also stressed his opinion that the subcutaneous administration of tuberculin was not dangerous, that a reaction often followed it within six to eight hours, not forty-eight hours as Dr. Penington had suggested, and that never was a reaction delayed for more than forty-eight hours, the rate of absorption determining the time of its appearance. Dr. Griffiths pointed out that the reason why the tuberculin reaction differed from allergy in its modern sense was that the meaning of the word had changed, and that tuberculosis differed in the nature of its toxæmia and its immune reactions from almost any other disease; the immunity in tuberculosis was almost entirely cellular, but there was some evidence of humoral immunity as well.

Chemotherapy in Pulmonary Tuberculosis.

DR. R. MUNRO FORD (Adelaide) read a paper in which he summarized the recent trend of chemotherapy in pulmonary tuberculosis. There were available for use streptomycin, dihydrostreptomycin, para-aminosalicylic acid, the sulphone group of drugs and perhaps neomycin and the thiosemicarbazone group of drugs. The mode of action of streptomycin was not fully understood, but it had been shown that it was bactericidal in high concentrations and bacteriostatic in low concentrations against actively growing tubercle bacilli. The main usefulness of dihydrostreptomycin appeared to be in its reduction of neurotoxic complications during treatment with high doses. The mode of action of para-aminosalicylic acid appeared to be bacteriostatic, and this was specific for the tubercle bacillus. It suppressed the growth of the bacillus by reducing oxygen uptake and by neutralizing the para-aminobenzoic acid necessary for the nutriment of the bacillus. Promin (of the sulphone group) also appeared to act synergistically to delay emergence of streptomycin-resistant strains; its relative toxicity precluded its general use. Tibione (of the thiosemicarbazone group) had been shown to be effective against *Mycobacterium tuberculosis*; it had a clinical effect rather similar to that of para-aminosalicylic acid, but gave rise to undesirable toxic effects. The two main hazards in streptomycin administration appeared to have been overcome by combining streptomycin with para-aminosalicylic acid and by reducing the frequency of the dosage. It was contended that these drugs should be used as early as possible in the treatment of all recent pulmonary tuberculous disease, including minimal disease. Streptomycin in doses of two grammes twice a week was considered an effective therapeutic agent against active pulmonary disease, but that régime should be continued for a period of time sufficient to guard against relapse of the disease. It was maintained that the earliest possible combination of chemotherapy with bed rest and surgery, when indicated, afforded the best opportunity to gain lasting control of pulmonary tuberculous disease.

DR. H. O. LANCASTER (Sydney) read a paper on tuberculosis death rates interpreted by the generation or cohort method. He said that under favourable conditions in a populous country it was possible to have for each calendar year the death rates for each sex at every year of life. These might be made into a table so that the rows consisted of the death rates by age in a particular year and the columns stated the death rates of age groups considered over a period of time. Dr. Lancaster said that he had discussed the three methods of interpreting the rates of such a table in THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1950, page 655. It was not always possible to discover rates for individual years of life for each calendar year, so that the time unit was sometimes taken to be ten years. For New South Wales the Government Statistician had always considered mortality rates only at the time of each census from 1891 to 1933. Dr. Lancaster had taken the figures for respiratory tuberculosis from the "Official Year Book of New South Wales" for 1941-1942.

In the usual method of interpretation of the rates in a single calendar period, the more recent experience seemed to indicate that the mortality had been postponed and the explanation was usually given that there was a lack of immunity owing to lessened infection in childhood. The generation or cohort method showed this postponement to be an artefact since in, say, 1931, the persons aged sixty

years had been submitted to a much higher rate of infection in childhood than the persons aged thirty years. The form of the mortality of successive cohorts was similar and the graphs did not cross, so that those cohorts with a high death rate at young ages maintained a relatively high rate throughout life.

DR. STEPHEN WILLIAMS (Sydney) asked for guidance from Dr. Ford as to the treatment which should be adopted for children diagnosed as tuberculous only by the tuberculin test. Twenty to thirty such patients were found each year in Sydney, and the decision had to be made whether they were to be treated by antibiotics, and if so, for how long. There was the risk that such treatment might result in the development of resistant organisms, with the possibility of the occurrence of meningitis which would not be amenable to treatment. Dr. Williams had actually had experience of such patients developing meningitis while under treatment; but, fortunately, in that case the organism had not become resistant to streptomycin.

DR. E. W. ABRAHAMS (Brisbane) said that in Brisbane it was thought that antibiotic therapy should not be withheld in more than a minority of cases, as with modern methods of treatment and the use of "P.A.S." there seemed little risk of development of resistant organisms, and so little risk of subsequently losing the advantages of antibiotic "cover" for patients eventually requiring surgical intervention. However, he did not mean to imply that chemotherapy would supplant other methods of treatment.

DR. COTTER HARVEY (Sydney) said that there was no sanction yet for the free and unrestricted use of antibiotics, and it was still questionable whether "P.A.S." did inhibit the development of streptomycin-resistant organisms. He considered it unwise to use bacteriostatics in lesions which were minimal and static, and believed that the sound rules which had been laid down by British and American authorities should be followed. Dr. Harvey was sure that Dr. Lancaster's paper would upset many preconceived ideas in relation to mortality from tuberculosis, and it was clear that the analysis of death rates by the "cohort" system opened up a new field. It seemed to be certain that the age of infection with tuberculosis was becoming later, and the cohort method might yet show that the peak incidence of primary infection was in early adult life.

DR. L. BEDFORD ELWELL (Brisbane) disagreed with Dr. Lancaster's contention that old people with tuberculosis were not examples of "survival of the fittest", and referred to a patient aged over eighty years who had been infected by his father and yet was in comparatively good health. Dr. Elwell thought that that man had established an immunity and was not an example of survival of a weakling. However, Dr. Elwell was aware that such infected old people constituted a vicious reservoir of infection which was often overlooked.

DR. K. N. UHD (Brisbane) asked for information regarding the reliability of the evidence on which Dr. Lancaster had based his curves, particularly the figures relating to earlier years before modern investigations became so common, and when perhaps death certificates were even less reliable than they were at present. Dr. Uhd considered that the indications for the use of "P.A.S." and streptomycin were now much wider than formerly.

DR. D. R. W. COWAN (Adelaide) said that at the Adelaide Children's Hospital in pre-streptomycin days, of 40 children aged under two years who reacted to the Mantoux test but showed no other evidence of tuberculosis, 16 died of tuberculous meningitis; but, after the introduction of streptomycin, among 40 children presenting the same evidence of tuberculous infection, who had been treated with the drug, there were no deaths.

Dr. Ford, in reply said that in the treatment of minimal lesions the time to attack with antibiotics was when there was a good blood supply, because with bed rest the lesion might be walled off and chemotherapy become ineffective. However, he made no plea for the use of chemotherapy in all cases, but advocated it only in those in which its use promised benefit.

Dr. Lancaster, in reply, said that when mortality rates were considered, the fallacy arose in regarding the mortality of one calendar year as being characteristic of the mortality of a cohort followed through life, and he illustrated the obvious differences revealed by the two methods of analysis when applied to the death rate of deaf mutes. It was wrong to generalize from the figures of one year to a whole lifetime, as was often done. However, there was one weakness in the cohort method, and that was that a drastic increase in mortality—for example, an influenza epidemic—would upset calculations. In reply to Dr. Uhd, Dr. Lancaster pointed out that, long before post-mortem examinations had become common, death certificates written in Britain a hundred years earlier had been a fair guide to the causes of mortality, and errors in death certificates affected equally the ordinary and the cohort method of interpretation.

Organization and Methods of the Victorian Cancer Registry.

DR. ROBERT FOWLER (Melbourne) discussed the organization and methods of the Victorian Cancer Registry, which he described as a planned experiment in statistical medicine. He said that the experiment was sponsored by six metropolitan hospitals and the Anti-Cancer Council of Victoria. During the six years of its existence approximately 12,000 case histories had been studied. The planned objective of the registry included collection, organization and analysis of quantitative data concerning (i) the incidence of cancer in relation to age, sex and anatomical site, (ii) the clinical attributes of the disease as observed in Melbourne, (iii) the results of treatment as practised in the particular hospitals under review. Dr. Fowler then described the registration procedure adopted at contributing hospitals. He said that additional documentation had been reduced to the simplest practical form. The designs adopted consisted of (i) an admission and discharge book, (ii) a registration card, (iii) a case-abstract card, (iv) a follow-up card and (v) an annual muster roll. The medical superintendent of the hospital was authorized to supply the central bureau with the requisite information in proper form. The superintendent delegated that responsibility to a cancer registrar and clerk, who kept all the appropriate records and maintained a careful scrutiny of the quarterly list of cancer deaths promulgated by the Government Statist for notices concerning former patients. Work at the central bureau was both administrative and statistical; the tasks of codification, analysis and presentation of results warranted a whole-time statistical service. Dr. Fowler discussed the application of mechanical assortment and tabulation by means of the punch-card system to the material, and described the registry code book; it contained 38 fields or sections, the smallest of which contained ten numbers, the largest 1000. Dr. Fowler said that from time to time the bureau issued a simple numerical conspectus of the morbidity situation with respect to the matters chosen for research. The registry was fortunate in receiving the collaboration of other organizations; Dr. Fowler named several of them, and mentioned the assistance they gave. With certain restrictions the design, direction and development of the registry were entrusted to an honorary chief registrar, a senior member of the medical profession. His staff consisted of a professional statistician and a junior clerk. Referring to finance, Dr. Fowler said that the primary responsibility rested with the Anti-Cancer Council, although contributing hospitals were put to extra expense by reason of added clerical assistance. The total expenditure, covering both the central bureau and the contributing hospitals, for the period 1948-1949 had been £1311 17s. 10d. Dr. Fowler finally said that the registry, by giving quantitative expression to the collective clinical experience of the contributing hospitals, would assist the medical profession as well as the public. If statistics were "the arithmetic of human welfare", as Lancelot Hogben suggested, statistical medicine did well to keep watch in the hospital laboratories and wards.

DR. C. T. PIPER (Adelaide), in opening the discussion, said that Dr. Fowler's paper was one which quite transcended criticism, but provided thought. Dr. Fowler's con-

tribution came most opportunely, for the Anti-Cancer Committee of South Australia had been groping toward such a set-up and now was offered it "on a plate". In its organization Victoria had set an example which other States could follow and the registry established in Victoria would make a notable contribution to cancer research. The time was approaching when the control of cancer must assume an important position in public health work, because with the improvement of sanitation, the control of bacteriological diseases and the pursuit of the viruses, the next advance would have to be against malignant disease whose place as a killer, despite improvements in treatment, had risen from one in 14 to one in seven in thirty years and constituted a major challenge in preventive medicine.

Dr. Piper was of the opinion that cancer research could well be divided into two sides—clinical and technical—and with the limited population and means of Australia, opportunity in technical cancer research must remain limited, there being no hope of attacking the problem on the mass-team lines of such institutions as Sloan Kettering and the British Empire Cancer Campaign. On the clinical side, however, a great deal could be done and in South Australia it had been decided that research funds should be devoted to that purpose and to such limited technical researches as might arise incidentally. It was obvious that the foundation of good clinical research was good records, and it was realized early that the collected South Australian records of 10,000 cases kept in the usual hospital manner by many different, mostly junior, personnel, were clumsy to handle and lacked the uniformity of detail necessary to good extraction. Accordingly, after examination of the Victorian Cancer Registry, South Australia had adopted the "punch-card" system and he had no doubt would follow the Victorian Registry method in its entirety.

As it was realized, too, that the hard-pressed "honorary" could not give personal attention to recording and that the junior registrar was a very uncertain factor in exact reporting, it had been decided to obtain the services of a senior man for that purpose, and it was also proposed that an executive officer, a fully trained and expert carcinologist, would be appointed. He would be a university officer, free from the claims of private practice, and it was not expected that the right man would be obtained for less than £2000 a year.

The South Australian programme envisaged the expenditure of a considerable amount of money, but the Cancer Appeal for £100,000 launched by the Lord Mayor of Adelaide in February, 1950, had already brought in £80,000, and his Committee expected to repeat that effort in three years' time—the moral being that the public, if fully informed and properly organized, would give and give handsomely to cancer work. He expected that there would be established a South Australian Cancer Society which would be a permanent standby when funds were needed, and which would help in cancer education, and his belief in the value of such lay auxiliaries was strengthened by the success of the South Australian Tuberculosis Association, which had been so valuable an instrument in promoting the attack on tuberculosis.

Dr. Piper urged that a central bureau should be established for the dissemination of information to keep Australian workers in the cancer field acquainted with what was going on in all States, and pointed out that it was only recently that South Australian workers had learned of the existence of the Victorian Cancer Registry.

DR. A. J. METCALFE (Canberra) said that apparently a great deal was being done in Victoria for £1300 a year, and asked what were the sources of income for cancer work in that State.

Dr. Fowler, in reply, explained that the Anti-Cancer Council of Victoria had been incorporated by Act of Parliament for specified purposes, and that originally £60,000 had been raised by public subscription. Half that amount had been invested and the balance spent in deep therapy apparatus, which was installed in public hospitals. Subsequently the Cancer Institute had been established by another Act, and it now operated independently of the Anti-Cancer Council. He considered that a corpus of £80,000 would be adequate for South Australia as, if the experience in Victoria was a guide, that amount would be substantially increased by bequests and benefactions. In conclusion, Dr. Fowler pointed out that the Victorian Cancer Registry was a proposition in statistical method, not limited to any particular branch of medicine, but one which could be applied to any disease in any State.

Modern Trends in Diphtheria Prophylaxis.

MR. R. W. PATTERSON and DR. E. A. NORTH (Melbourne) presented a paper on modern trends in diphtheria prophylaxis. They said that the paper was concerned only with the active immunity provoked by injection of antigens. An antigen had been defined as any substance which, when introduced parenterally into animal tissues, stimulated the production of an antibody, and which, when mixed with that antibody, reacted specifically with it in some observable way. Diphtheria toxin completely fitted that definition. Mr. Patterson and Dr. North discussed the factors that influenced the antitoxic response to an antigen in animals and in man; those applying particularly to man were three: (i) diphtheria experience and latent immunization, (ii) potential immunizability, and (iii) the amount of specific antigen injected and even the stimulus of the toxin used in Schick testing. They then briefly discussed stages in the development of the modern diphtheria prophylactic, from the work of von Behring in 1913, and referred to the preparation and use of alum-precipitated toxoid. They said that some workers had hesitated to use alum-precipitated toxoid for children aged over seven or eight years, because of the occurrence of severe reactions in the higher age groups. In 1947 Holt had announced the production of a new prophylactic, purified toxoid adsorbed on aluminium phosphate (P.T.A.P.), which was said to have advantages over alum-precipitated toxoid including relative freedom from reactions. Mr. Patterson and Dr. North said that P.T.A.P. was prepared at the Commonwealth Serum Laboratories, Melbourne, and went on to describe the method of its preparation. They said that it was an accurately prepared prophylactic which, with regard to its antigenicity, its stability and its freedom from causing reactions, had been held to be superior to alum-precipitated toxoid. Several arguments were advanced in favour of the intramuscular route of administration, one being that it conferred better immunity than did subcutaneous injection; that was important when it was not certain that the child would receive a second inoculation. However, it was necessary to avoid regarding P.T.A.P. as the long-looked-for "one-shot" diphtheria prophylactic; it might be, but the result of further trials must be awaited before a definite pronouncement was made. It was possible that an antigen such as P.T.A.P., which was potent and slowly absorbed, would provide the stimulus necessary for the production and maintenance of adequate antibody. Investigations were in progress, and until the results were known two well-spaced doses should be given. Referring to dosage and reactions, Mr. Patterson and Dr. North said that even with P.T.A.P. allergic reactions might occur in older children and in adults, though to a lesser degree than with alum-precipitated or formol toxoid. Children up to the age of six years might be safely immunized without a preliminary sensitivity test. The optimum dosage had not been determined, but it seemed that the first dose should be the larger. Holt considered that children aged over six years should first be "screened" with the complete Schick test, which included a control injection with heated toxin; that refinement distinguished susceptibility to diphtheria from allergy. In conclusion, Mr. Patterson and Dr. North put several questions to those present. (i) What dose of P.T.A.P. was sufficient to provide an adequate primary stimulus in the great bulk of children? (ii) Could that dose be given safely to all groups without preliminary screening? (iii) If the answer to the previous question was "no", what groups should be screened, and how should that be done? They said that those questions required to be answered before immunization with P.T.A.P. could be placed on a completely sound basis.

DR. E. F. MACKENZIE (Melbourne) presented the result of field trials of P.T.A.P. carried out by the Department of Health, Victoria. The substance used was prepared by the Commonwealth Serum Laboratories. Dr. Mackenzie said that about 3000 children had been given one or more doses by inoculation, without untoward results. P.T.A.P. could be considered a safe prophylactic agent against diphtheria. It was easy to use, but like other toxoids, it would give rise to reactions in the later age groups. In the trial under discussion only four children in every 1000 had reactions which necessitated bed rest. In comparison with prophylactic agents in general use in Australia—alum-precipitated toxoid and formol toxoid—it could be said that P.T.A.P. did not cause such severe local reactions as alum-precipitated toxoid, nor did it necessitate so many injections as formol toxoid. The general over-all conversion rate to "Schick-negative" was 99·8% among 1550 children who received 0·75 millilitre of P.T.A.P. divided into two doses. Dr. Mackenzie then discussed the recommended dosage. He said that the interval between the doses should be four to six weeks. For infants the first dose should be 0·25 millilitre given subcutaneously, and the second dose 0·5 millilitre. For school children the first dose should be 0·25 millilitre and the second dose 0·5 millilitre, unless such a dose was contraindicated, when the second dose should be reduced to 0·25 millilitre or omitted. Adults or students *et cetera*, who had mostly been inoculated, should first be Schick tested; one should then proceed cautiously by giving doses of 0·25 millilitre to those who reacted to the Schick test. "Boosting" doses, as required by previously inoculated children beginning school, should consist of 0·25 millilitre given in one injection. Schick tests were as a rule not necessary, except when one was dealing with special groups most members of which had previously been inoculated.

DR. G. COLE (Melbourne), in opening the discussion, referred to the untimely death of Dr. Charles Adey, of the Commonwealth Serum Laboratories, who had given so much help in establishing the value of immunization in Victoria. The question of dosage and whether the larger or the smaller dose should be given first were still matters of controversy, and while deference should be given to the experience of such men as Bousfield, Merrillees found, using formol toxoid, that a small preliminary dose gave some safeguard in the event of the occurrence of untoward reactions. He noted that Dr. Mackenzie shared that view and used a first dose of 0·25 millilitre followed by a second dose of 0·5 millilitre. Trials were continuing in Victoria, and Dr. Crome, carrying on Dr. Mackenzie's work, had conducted an immunization campaign at Box Hill, where of 386 children tested, 263 were "Schick positive". In August, 1949, 259 children were given two doses, and in February, 1950, 167 were retested—165 had become "Schick negative" and three of the 167 had been given only one injection. Comparable results had been obtained at Chelsea, where, in 1949, 173 cases were dealt with, 165 children receiving two injections and eight receiving one. Retested in February, 1950, all that group had become "Schick negative". The results so far had been most encouraging, and if it was possible to develop a "one-shot" method the work would be greatly simplified, but even with two doses a great deal of work was obviated and he considered P.T.A.P. to be a valuable agent.

DR. A. FRYBERG (Brisbane) asked for advice regarding the optimum age for commencement of immunization, and recalled that during his recent visit to the United States Dr. Myers, of San Francisco, had said: "Tell Australia that a 'one-injection' method will not give complete immunization."

DR. D. W. JOHNSON (Brisbane) said that recent work had shown that infants of three months could be successfully immunized, although some authorities regarded nine months as the minimum age for immunization, and a decision regarding the optimum age was important because they were concerned in Queensland at the increase of cases of diphtheria in children under one year. He also sought advice regarding the interval between injections and when P.T.A.P. would be generally available, and referred to doubts which had recently been cast on the validity of a Schick-negative reaction as an indication of the immunity level.

Dr. E. North, in reply, said that Bousfield had suggested that all infants over four months who had acquired immunity from their mothers had lost it by that age, and accordingly advocated immunization at that time. In his own opinion immunization at any time after six months was perfectly safe, and he considered that, within practical limits, the longer the interval between the first and second doses, the better the results, and advised injections at intervals of six weeks. P.T.A.P. was slowly absorbed and eliminated, and stimulation of antibody production probably occurred over a long period, as guinea-pig experiments had shown that nodules resulting from injection could be excised and, after being ground, the material used for the production of immunity in other animals. It was possible that P.T.A.P., being slowly absorbed, acted as both a primary and a secondary stimulant. Production of P.T.A.P. was being hastened and it would be generally available in the near future. Commenting on the validity of the Schick test as a clinical test of immunity, Dr. North referred to Bousfield's statement that he knew of only one individual of "Schick-negative" status who had died of diphtheria and there was even some doubt regarding that case.

Dr. E. Forbes Mackenzie, in replying, said that he had recently tested 40 mothers and babies. Some of the mothers were "Schick positive" and therefore had "Schick positive" babies. That meant that there were two classes of babies —"Schick positive" and "Schick negative"—and with the decline of the incidence of diphtheria a large number of mothers were now "Schick positive". He did not advocate the Schick testing of babies, but urged the immunization of young babies and referred to McLorinan's observation that diphtheria in young babies was usually of the nasal type.

Immunization Against Tuberculosis in Australia and New Guinea.

DR. E. A. NORTH (Melbourne) and DR. D. JAMIESON (Papua) presented a paper on immunization or stimulated protection against tuberculosis in Australia and New Guinea. They stated that such protection was obtained by inoculation with *Bacillus Calmette-Guérin* (B.C.G.). The inoculation was with living organisms, which did not possess sufficient virulence to produce ill-effects, but stimulated the body to raise its defensive mechanism against invasion by the more harmful tubercle bacillus. B.C.G. vaccine had been accepted, but not until great and bitter controversies had taken place between various authorities. Scandinavian workers were well to the fore in showing that nurses who, on being tested, showed little or no resistance to tuberculosis, were prone to develop the disease during their training. It was claimed that inoculation with B.C.G. increased the resistance of such nurses and lowered the risk, and this claim was subsequently confirmed by investigators in Canada and over a large series of cases in America.

At the Sixth Session of Congress in 1948 the use of B.C.G. had been advocated by several speakers, and towards the end of 1948 the Commonwealth Serum Laboratories had made the vaccine available for general use.

B.C.G. vaccination was controlled by the various State health authorities, and was restricted to those without resistance ("Mantoux-negative" subjects) living or working where infection was probable or likely.

The result of studies of B.C.G. vaccination on native races had been so satisfactory that there were good grounds for believing that it would help greatly towards control of tuberculosis amongst the native races of New Guinea and the Pacific Islands. Investigations were being carried out amongst those people. Dr. North and Dr. Jamieson gave a detailed account of the work, the magnitude of which was quite unsuspected by "the man in the street".

DR. R. M. FORD (Adelaide) did not wish to discuss the pros and cons of B.C.G. vaccination, except to point out that there were still a few prominent men who opposed its use in an unselected section of a community, maintaining that the imposition of infection with the conversion of the Mantoux reaction, no matter how mild and how much resistance to virulent organisms it might produce, was a doubtful procedure except where the incidence or degree of exposure was much greater than that which obtained in the country as a whole. He was of the opinion that the best way to eradicate tuberculous disease was the isolation and treatment of patients, but as no facilities for treatment apparently existed in the central areas, he thought that the best possible step had been taken to vaccinate, as soon as possible, all those in the highlands of New Guinea who had as yet not contracted the disease and, if that view was accepted, the next step was to ensure that action taken was effective and lasting. At the present time the balance of world opinion was between the intradermal multipuncture method in which a mechanized "gun" was used, and the single puncture method given by means of a syringe. Aronsen, of America, adhered to the latter method as it appeared to ensure more uniform dosage. Those favouring the multipuncture method claimed that with it there was less chance of human error, for example, with struggling children, and that by spreading out into many punctures a virulent inoculum, the risk of local abscess formation was minimized. Birkhaug and Tornell had found that the allergy produced was directly related to the size of the vaccination reaction, and Birkhaug had also found that resistance to infection increased with the number of B.C.G. microorganisms inoculated.

Dr. Ford then presented the following analysis of cases in which B.C.G. vaccination was carried out in Adelaide, by use of dried culture obtained from Dr. Staplethorpe in England. The multipuncture "gun" method had been used in 980 cases. The total number of persons not reacting to the Mantoux test (1 in 1000) after inoculation was: (*a*) after two months, two of 900 persons examined, or 0·22%; (*b*) after eight months, nine of 605 persons examined, or 1·49%; (*c*) after twenty months, ten of 306 persons examined, or 3·27%. In no instance had tuberculous disease arisen after that type of vaccination. In almost all cases good Mantoux reactions had occurred without vesiculation and in practically all cases examined the reaction maintained the same size twenty months after inoculation. The single puncture intradermal method of B.C.G. vaccination had been used since January, 1949, in 1200 cases (Commonwealth Serum Laboratories vaccine). The total number of persons not reacting to the Mantoux test (1 in 1000) after inoculation was: (*a*) after two months, 75 of 1030 examined, or 7·28%; (*b*) after eight months, 15 of 417 examined, or 3·6% (following a previous positive Mantoux reaction). The number of Mantoux (1 in 1000) reactions over 20 millimetres in diameter was 535, or 51·9%; the number of reactions of from ten to twenty millimetres in diameter was 290, or 28·2%; the number of reactions of less than ten millimetres in diameter was 205, or 19·9%. The Mantoux reaction had become less than ten millimetres in diameter after six months in 67 out of 417 cases, or 16·1%. Abscess formation had occurred and been accompanied by general malaise in nine cases, or 0·9%. The percentage of positive Mantoux reactions (1 in 1000) at two months, at eight months and at twenty months had been 99·5, 98·51 and 96·73 with the multipuncture method, and at two months and eight months, 92·72 and 96·4 with the single puncture method.

DR. E. NORTH (Melbourne) said that he was most interested in Dr. Munro Ford's comparison of results of immunizations performed by the single and multiple injection methods. It was difficult to compare results from the use of vaccine produced and used on the spot and those from the use of transported vaccine, but good results in Mantoux conversion from transported vaccine had been reported from different centres, including reliable accounts from New Zealand of 100% conversion with such vaccine. He considered it by no means certain that optimal doses were at present being given, but that aspect was being investigated in Melbourne with the aid of preclinical year medical students, whom it was proposed to vaccinate with different doses. It was then proposed to compare the durability of Mantoux conversion following single and multiple injections. He could assure the meeting that Dr. Jamieson was only too aware of the difficulties facing him in his work in New Guinea, and that he was endeavouring to solve them.

DR. D. R. W. COWAN (Adelaide) said that he was already a B.C.G. convert, but he was not certain of the optimal dose or method of injection. In South Australia a good conversion rate had been obtained with Commonwealth Serum Laboratory vaccine, but the durability of conversion had not yet been determined and more research was needed. He hoped that the present procedure, which required a person being vaccinated to make eight visits to his doctor in the year of vaccination, would be simplified.

Dr. Jamieson said that Adelaide writers frequently reported five millimetre reactions after vaccination, but Dr. Church, working in the Tuberculosis Bureau in Melbourne, found 16 millimetre reactions to be common. It was possible in New Guinea to set aside areas where superinfection did not occur, and it was hoped eventually to be able to ascertain how long B.C.G. conversion would last. He had found, using dried vaccine in 2000 cases intradermally, that the positive reactions were poor and the conversion rate low, but workers at the Pasteur Institute had suggested that such vaccine might be better given by scarification, and he was willing to try that method.

Poliomyelitis and the Practitioner.

DR. G. E. COLE (Melbourne) said that Dr. B. P. McCloskey, of the Victorian Health Department, had been asked to read a paper on poliomyelitis, but he was not available as he had been sent abroad to study the disease. In the paper which he intended to present, Dr. Cole had incorporated some of Dr. McCloskey's findings. He wished to pay a tribute to the practising members of the profession in Victoria for their work in alleviating the sufferings and distress caused by the recent epidemic.

Dr. Cole showed several slides. The first dealt with the quarterly incidence in Victoria from 1935 to 1949, inclusive. It showed that the State was seldom free from the disease. The incidence in 1949 was only one-third of the size of the 1937-1938 epidemic. Also, whereas the 1949 epidemic was preceded by a period of relatively high incidence, the figures preceding the 1937 outbreak had been particularly low. The second slide showed that the increase in incidence from day to day in 1949 from January to December had been slow but steady. Dr. Cole explained how he had tried to postpone the declaration that an epidemic existed, in order to prevent or postpone the popular alarm caused by such a pronouncement. Appropriate control measures were being taken, but at length the existence of an epidemic had been admitted. Steps had been taken to assist medical practitioners by the provision of a panel of consultants for diagnosis, a panel of orthopædists for advice on after care and of physiotherapists. The measures recommended to the medical profession included vigilance for prodromal symptoms and early diagnosis. The number of calls on diagnostic consultants had totalled 755. Dr. Cole's third slide showed the magnitude of the 1949 epidemic in relation to that of 1937. It showed a feature which had been noted in all recent epidemics—a higher proportion of victims over ten years of age. There were as many sufferers over fifteen years of age in the 1949 epidemic as in the much larger epidemic of 1937. In the 0-5 and 5-9 years age groups were shown some sixty children who gave a history of inoculation with whooping-cough, diphtheria or combined prophylactic injection within three months before the onset of their illness. In the fourth slide it was seen that in the Nicobar Islands, an isolated and primitive area in which, as far as could be determined, the disease had been previously unknown, there was the same scatter of cases over the first three decades as had been experienced in Victoria. The fifth slide showed that males bore the brunt of the disease. The sixth slide showed that during

1949 the case rate was highest in the 5-9 years age group in the metropolitan and rural areas; in the urban areas the 0-5 years age group showed the highest case rate. The rate was relatively higher in the later age groups in the rural areas than in the same age groups in the urban and metropolitan areas. The last slide showed that the disease was far more fatal in the later age groups and more than twice as deadly to males than to females. The figures presented referred only to the year 1949, in which there occurred 795 cases.

Dr. Cole concluded with some remarks on after care, in which he spoke about the plight of patients over fourteen years of age. There were not sufficient institutional beds.

DR. A. FRYBERG (Brisbane) said that the observation in the recent Victorian epidemic of the shift from the infantile pattern of poliomyelitis—where the greatest incidence was in the one to three year group to the five to nine year old group—had been made in most countries throughout the world. The epidemic in Mauritius, however, four or five years previously had been of the infantile type. In addition, the differentiation of the incidence in metropolitan areas, large country towns, and smaller country towns of Victoria showed the shift to be to the higher age groups in inverse proportion to the population, the age incidence in the smaller country towns being maximum in the ten to fifteen years group. The explanation given in the infantile pattern was that children developed an immunity during the first four or five years of life, owing to the frequency of exposure and infection in childhood. Likewise, because of the lesser opportunity for exposure, children in country areas developed their immunity at an older age. The shift to the five to nine year age group, however, caused one to question whether this was the only factor. No satisfactory explanation had been given for the shift, but among the contributory factors advanced were improved hygiene which delayed infection—an observation noted in other communicable diseases—alterations in the age grouping of the population, and the fact that smaller families lessened the opportunity for one member of the family to become infected from another. When in England in 1946, he had been informed that paralytic poliomyelitis epidemics, as seen in Australia, did not occur in that country. The last large group of infections occurred at the end of the last century, but since that time endemic cases had cropped up periodically. It was presumed on the exposure theory that infection had taken place, but because of low virulence very few cases of paralysis had occurred. An epidemic had occurred in 1947. It was noted that the greatest age incidence was in the five to nine year age group. Exposure of the nil to four group must have occurred because of the overcrowding which followed the destruction of houses by bombs; therefore the children, because of this contact, should have had ample opportunity to become immunized. It would be expected that the nil to four group should have been infected.

Measles and diphtheria, like poliomyelitis, had an infantile pattern, and it had been noted that there had been a shift in the age groups of those diseases, though not to the same degree. Generally speaking, exposure of the non-immunes to a disease was followed by an attack of the disease, though that was not absolute, the percentage affected varying according to age, infants being more susceptible than those in the older age groups. Aycock had explained that in part by the presence of a non-specific resistance which developed as a person became older, but other factors had also to be considered, such as the lessened frequency of exposure in older age groups and household habits which gave less opportunity for infection. If the non-specific resistance suggested by Aycock was correct, the graphs of the incidence at different ages in the urban and rural areas would within limits correspond. It was a well-established fact in many epidemics that the average age incidence had been higher in the country than in the city. It had been proved that in large families diseases of infancy developed early in life, so, with the present-day small families, there was less chance of a non-immune having intimate contact, and the tendency was for the disease to develop later. The theory that hygiene played a part in producing immunity was supported by the work of Hammon and others. The sera of persons belonging to groups of varying income levels and natives living under primitive conditions had been compared, and it was found that the percentage possessing antibodies was higher among those in the lower income levels than in the higher income groups. Of the natives in the Pacific Islands, who lived under primitive conditions, 100% gave positive findings in the age groups above four years. In most areas the percentage of antibodies present was less in the one to three year age group than in the four to six year group, which in turn was less than in the seven to nine year group, the exception being San Francisco, where the highest percentage obtained was in the four to six year group. After that age there was a tendency for the percentage showing antibodies to decrease. Hammon advanced the suggestion that infection as a result of exposure occurred most readily in the younger age groups and that the antibody titre fell if infection was not frequently repeated. With better hygiene that did not occur sufficiently often to keep the titre up. Again, in small families, with diminished frequency of exposure due to less opportunity of the introduction of infection from outside, the antibodies were diminished because of non-infection, hence when an exposure did take place later, the exposed person developed the disease, and so the altered age pattern might be explained. In the survey carried out by Hammon it was shown that the percentage of children with antibodies was less in small families than in large families. Once a member of a family became a carrier, the virus spread rapidly through the whole family. Another interesting point in the Victorian epidemic was the increase in incidence during the winter months, a phenomenon which was also noted during the winter in the north of Canada. No satisfactory explanation had been given for this change of seasonal incidence, and both the Victorian and the Canadian epidemics rather unset the suggestion that warm weather altered the host-virus relation. Another point of interest in the Victorian epidemic was that whereas in 1949 the total number of patients under the age of ten was 423, as against 372 over that age, in 1950 there were 47 patients under ten years of age, as against 75 over. The shift of age as the epidemic progressed had also been noted in the Victorian epidemic of 1938-1939, and it had been observed elsewhere overseas. The cause could not be ascribed to the greater opportunity for exposure as that had been present throughout the epidemic.

Referring to administration, Dr. Fryberg agreed that a panel of consultants was an excellent idea because it reduced the number of admissions to hospital, but he deplored the making of recommendations which had no epidemiological warrant and caused public alarm. One body of consultants recommended that certain fruits should not be eaten, another that ice cream be banned. He was of the opinion that any measures which would improve hygiene should be recommended, as such measures were reasonable on epidemiological grounds, but as yet food had not been implicated except in a rare milk outbreak, so care should be taken not to upset the economy of the State. The closure of schools should depend on whether the avoidance of contact among children could be enforced better in or out of school, and in one of the epidemics in the United States it had been found that the rate of spread increased among the children of school age when the school resumed after vacation.

DR. H. MCLORINAN (Melbourne) said that he welcomed the opportunity to pay public tribute to the sympathetic health administration in Victoria, with which it was possible to communicate freely and discuss problems. As medical superintendent of the Queen's Memorial Infectious Diseases Hospital, Fairfield, he had received the greatest possible cooperation from the Health Department. The appointment of poliomyelitis consultants had been of great value, both in preventing unnecessary admissions to hospitals and in educating general practitioners, particularly in the early days of the epidemic. Dr. McLorinan stressed the importance of early bed rest, in suspicious

cases, in the prevention and/or limitation of paralysis, and referred to the difficulties associated with a diagnosis of "non-paralytic poliomyelitis". Until it was possible to tell with precision which patients actually were suffering from poliomyelitis, research would be hampered, and at Fairfield patients admitted as suffering from "non-paralytic poliomyelitis" had been found to be suffering from mumps, infective mononucleosis and other conditions. He was convinced of the danger of moving patients over long distances and urged that if patients had to be moved, they should be transported to the nearest base hospital and not to an infectious diseases hospital, perhaps many miles away. Provision of an adequate supply of respirators was important, and, at Fairfield, some two dozen which had been built during the earlier epidemic had been available at the outset of the 1949 epidemic. However, many of them were child respirators and useless in the recent epidemic, when most respirator patients had been adult. Accordingly the policy of his hospital now was to build only adult respirators, which could be adapted for use for patients of any age. Dr. McLorinan could offer no explanation of the shift of the age group incidence in the Victorian epidemics.

DR. C. E. COOK (Sydney) said that Dr. Cole's paper supported his own experience in the Western Australian epidemic in regard to "age shift" and the higher mortality among country patients, which he thought had perhaps resulted from their transport to Perth over long distances. Many such patients had been sent in ambulances past base hospitals with respirators and had arrived in Perth moribund. Dr. Cook asked had there been any investigation during the Victorian epidemic of the question of mortality among pregnant women, who had contracted poliomyelitis, to which attention had been directed by Snow. In the Western Australian epidemic, of twelve pregnant women who contracted poliomyelitis, six had survived and given birth to female infants, and six had died, five of them bearing male infants, the sex of the sixth child not being recorded.

Dr. Cole, in reply, said that in Victoria no action had been taken regarding food supplies, but the Consultative Council on Poliomyelitis had recommended the boiling of milk, and that recommendation had been interpreted by milk interests as an attack on the industry. It was not considered that ice cream was likely to be a vector, provided it reached the consumer after pasteurization and packaging in a factory, but ice cream dispensed from metal containers in retail shops could be contaminated. The closure of schools had always been opposed in Victoria, unless some special reason existed, and, in the 1949 epidemic, the Education Department had been asked to exercise clemency in those cases in which parents had kept their children from school, and not to admit transferred children to schools until those children had resided for not less than two weeks in the new area. The closing of kindergartens did not interfere with education and parents had been advised to keep young children at home. All schools had been urged to abandon competitive sports on account of the risk of precipitating paralysis in children, who might be in the incubation period of poliomyelitis and in whom exhaustion might have disastrous results. Dr. Cole said that he had no information regarding poliomyelitis in pregnant women.

Dr. McLorinan said that in the Victorian epidemic, of 45 women over twenty years of age who had been admitted to Fairfield with poliomyelitis, 14 were pregnant and three had died, but no record had been kept of the sex of their children.

Occupational Factors in Pulmonary Dust Disease.

DR. G. C. SMITH (Sydney) read a paper entitled "Occupational Factors in Pulmonary Dust Disease". He stated the definition of pneumonokoniosis adopted at the Third International Conference of Experts on Pneumonokoniosis held at Sydney early in 1950, and outlined its scope. Dr. Smith stressed the need for a complete and accurate occupational history in the diagnosis of pulmonary dust disease. He said that the potential capacity of a dust to cause disease depended chiefly on its composition and nature, its particle size, and the intensity of exposure. In addition to dusts containing high percentages of free silica, others from which free silica was absent (asbestos and certain metals) were capable of producing severe pulmonary damage. In most dusts, asbestos being the exception, the harmful particles were those less than about 5·0μ in size. Intensity of exposure, which varied for different dusts, depended on the atmospheric concentrations of dust and on the duration of exposure. Dr. Smith gave a brief account of a case in which silicosis developed rapidly. With regard to the main occupations and dusts associated with a risk of pneumonokoniosis, Dr. Smith mentioned diseases caused by silica, coal and asbestos, and also the radiographically evident abnormalities of certain basalt workers and biograph operators, and the pulmonary effects of talc, graphite, cement, zinc, cadmium, beryllium, manganese, iron, aluminium, synthetic abrasives, cotton, bagasse and wheat. He also drew attention to the occurrence of pulmonary carcinoma in workers exposed to chromates, arsenic and asbestos. Dr. Smith then set out the following nine measures to be applied in the suppression and control of dust and in the protection of workers; he said that they did not vary with the industry or with the type of dust. (i) The abolition of processes creating harmful dust. If that was not possible, the total enclosure of such processes in mechanically ventilated structures, or their segregation from other operations in the factory. Isolation could be applied either geographically or by time—the carrying out of a dusty process when no other workers were in its vicinity. (ii) The use of a harmless material in place of one that was dangerous. (iii) The removal of dust at its point of origin by local mechanical exhaust ventilation. (iv) The use of water or other wetting agents to prevent dust from certain processes from becoming air-borne. (v) Electrostatic precipitation. (vi) The provision of adequate general ventilation to dilute contaminated air. (vii) The maintenance of a high standard of plant cleanliness and housekeeping. (viii) Personal respiratory protection of the worker. Respirators should be worn only when other methods of protection were not practicable, or for jobs of short duration. They should be well-fitting, comfortable and efficient, and should be kept clean. (ix) Preemployment and periodical medical examinations, including chest radiography, of workers exposed to a dust hazard.

DR. W. E. GEORGE (Sydney) said that in investigating cases of pneumonokoniosis, it was important to obtain a detailed record of former employment, as there was a tendency for a man changing from an industry with a silica risk to another non-siliceous industry, to suppress information of his earlier occupation. Unless, too, a careful occupational history was taken, ridiculous errors might arise. He quoted the case in which a radiological report had been received from a large Sydney hospital of "typical pneumonokoniosis", the patient being a bank manager! Speaking of coal miners, Dr. George said that intermittently they were exposed to a high concentration of silica dust, particularly when shaft-sinking, roof-brushing or driving in sandstone, and, as coal raisers, they did not realize the dangers of such dusts. It was at times difficult to estimate the number of years during which a coal miner had been exposed to dust risk, as coal miners worked intermittently at their occupation. Probably a third of the number of years a coal miner said he had worked in the industry could be deducted before an estimate of the actual years of employment was made. Experience had shown that unless there was free silica in the dust inhaled, it was unusual for tuberculous complications to develop. Many of the industrial dusts were not of great importance, because only small numbers of employees were at risk and in factories the dust problem could be dealt with better than in coal mines, but it was a good working rule to regard all dusts as harmful. At the recent Pneumonokoniosis Conference in Sydney the possibility that free silica might reactivate tubercle bacilli of low virulence had been mentioned, and it was suggested that "B.C.G." might have its virulence raised if subsequent to its administration free silica dust was inhaled.

DR. W. COTTER HARVEY (Sydney) said that he was interested in Dr. George's last statement, and referred to a patient, an insurance inspector in his late forties with pneumonokoniosis, who twenty years earlier had spent five years in the mines at Kalgoorlie. At times it was difficult to find tubercle bacilli in some fibrotic cases, and he recalled one case regarded as pure silicosis with "a snow-storm X-ray" picture in which two years later tubercle bacilli had been found with no demonstrable changes in the radiological picture. Commenting on the case of the two brothers (biograph operators) quoted by Dr. Smith, Dr. Harvey said that he had examined them both; one brother had emphysema and was dyspnœic and disabled, whereas the other brother with equal evidence of pneumonokoniosis had no emphysema and was fit to continue with his work—an illustration of the evil effects of the development of emphysema in such cases.

DR. ALAN PENINGTON (Melbourne) said that two questions were of importance. One was whether a predisposing infection was necessary before pneumonokoniosis developed. The other was whether removal from exposure prevented progress of the disease. In his own experience it did not.

DR. D. GORDON (Brisbane) said that at times it was difficult to obtain a good industrial history and the industrial hygienist could help the clinician considerably because dangerous pits were known and foundries had been classified in relation to dust risk. There was a tendency for the clinician to associate disease with occupation and to assume, for example, that a painter suffered from lead poisoning, or that a sewer digger was exposed to a dust hazard, whereas, in fact, it might be only certain sections of an industry which were dangerous. Again, an industry carried on in different localities might be dangerous in one and not in another, as exemplified by the fact that sewer constructors in Sydney were working in sandstone, whereas in Brisbane they worked in a schist which was usually damp and offered no hazard.

In further illustration of the difficulty sometimes encountered when an attempt was made to trace the past industrial history of a patient, Dr. Gordon referred to a man with silicosis who worked in an atmosphere contaminated with chlorine; it was at first puzzling as the man denied any possibility of exposure to silica dust, but eventually it was found that at an earlier period he had worked for thirteen years in the abrasive soap industry.

Dr. Gordon said that bagassosis occurred in Queensland, but the main risk lay in the handling of dry bagasse in lofts and, although it was the custom in the cane mills to burn waste in the furnaces, the resultant ash containing about 25% of silica, the exposure of boiler cleaners was limited and intermittent, and they were not subject to any great risk. One type of patient who caused worry was the elderly man, not infrequently a grinder in a factory, who on his first X-ray examination showed almost massive fibrosis, but in whom no tubercle bacilli could be detected. It was not desirable to put such a man off work, but there was always the possibility that he might be harbouring bacilli and be a risk to fellow workers.

Dr. Smith, in reply, said that the points raised by the speakers in reference to the importance of industrial histories emphasized what he had said in his paper. Referring to Dr. George's remarks, Dr. Smith said that it was very difficult to ascertain the actual degree of exposure of coal miners to silica, and there was no doubt that at times they were at risk, but examination of affected coal miners' lungs *post mortem* showed that they contained less silica than was found in classical cases of silicosis. In answer to Dr. Penington, Dr. Smith said that in many cases of silicosis there was a predisposing infective condition, but that was not a factor essential to the development of the disease and, in his experience, removal from exposure to dust did not arrest progress of fibrotic changes. In conclusion, Dr. Smith said that recently a brick "dragger" loading bricks from a barrow, and not entering the kiln, had been found to have advanced fibrotic changes with tubercle bacilli in his sputum, and it had not previously been thought that a hazard existed to those handling bricks in such circumstances.

The Diagnosis and Control of Smallpox.

DR. C. L. PARK (Hobart) discussed smallpox. He said that with the advent of aircraft the possibility of the introduction of smallpox into Australia was increased. As Australia was largely an unvaccinated country, the quick control of such a disease would depend on the isolation of patients at the earliest possible moment and on the prompt taking of precautionary measures. Smallpox remained endemic in certain eastern countries, with seasonal epidemic prevalence in the first quarter of the year. The causal agent was a virus, which was stable, and which retained its viability under unfavourable conditions of temperature. It was spread in two ways, directly from person to person, and indirectly through fomites. The incubation period until the development of the rash was fourteen days; the period was irregular in modified smallpox. The invasion period was characterized by an abrupt onset of toxæmic symptoms, which subsided on the appearance of a focal eruption. The eruption was at first macular; then papular, vesicular and pustular stages followed in regular sequence. The last stage was the drying stage when crusts formed; these left a pitted skin surface when the crust fell off. Buccal lesions appeared early, and the rash preferred the upper half of the body to the lower half. It was a rash of the face rather than of the arms and legs; of the distal ends of the limbs rather than the proximal ends; of the back of the trunk rather than the front; of the extensor surfaces rather than of the flexor surfaces. It shunned the most pronounced flexures such as the axillæ. The centrifugal distribution gave the key to the diagnosis, as Ricketts had shown in 1908. The laboratory diagnosis was made (i) by the detection of the virus in scrapings from lesions, and (ii) by the detection of variola antigen in vesicle fluid. The differential diagnosis had to be made from (i) measles in the early stage, (ii) chickenpox, by the distribution of the lesions (chickenpox was a rash of the body, smallpox was a rash of the face), and (iii) drug rashes. The clinical history and the distribution of the lesions would help. Formerly treatment had been by administration of the sulphonamides; these had been superseded by penicillin and streptomycin. With regard to prevention, Dr. Park said that successful vaccination and revaccination would give absolute protection. Administrative control required isolation of patients and vaccination and surveillance of every possible contact. Two complications might follow vaccination, post-vaccinal encephalitis and generalized vaccinia. Encephalitis was probably due to the presence of an unknown virus previously introduced into the body, but quiescent until activated by the vaccinia. It affected only a few countries, and the safest method of avoiding it was to carry out primary vaccination prior to school age. Generalized vaccinia was rare in adults, and nearly always affected children; it affected only those vaccinated for the first time.

DR. CYRIL COOK (Sydney) said that the subject of smallpox might at any time be of great importance to the medical profession in Australia. It was important to determine the values attaching to the work of Wilkinson, of Hong Kong, in relation to vaccination. He claimed that it gave protection for two years and then its effects rapidly waned, first in relation to toxæmia, then to the number of lesions and finally to maturation of lesions. Thus it was possible for a patient with smallpox, vaccinated more than two years previously, to die of toxæmia with no rash, or if contracting the disease at a later period, to have few lesions and yet die of toxæmia.

In Australia there were now a large number of vaccinated ex-service personnel and an outbreak of smallpox might present many diagnostic difficulties, because if infection occurred within the first decade after vaccination, the number of spots on the body might be of little help in diagnosis. Another question for consideration was the so-called "immune reaction". Until recently it had been understood that an early papular reaction following fre-

quent revaccination was an "immune reaction", but it was now said that this was merely an allergic manifestation and, if so, certain practical difficulties arose. Persons who had been frequently revaccinated and were assumed to be protected, quite commonly showed that allergic reaction, and others, vaccinated for the first time with a complete "take", in some cases subsequently had the so-called "immune reaction". Were they to be regarded as failures of vaccination? If the work of Wilkinson was accepted—that protection against toxæmia was first lost, then against the number of lesions and finally against maturation of lesions—it had to be assumed that as protection against maturation was the last to go, a successful vaccination would be followed on revaccination by papule—vesicle—pustule—scab at an accelerated rate, and, with frequent revaccination, the acceleration might be so great that the papular reaction actually was an immune reaction.

DR. E. NORTH (Melbourne) said that Arnold Rich in "The Pathogenesis of Tuberculosis" remarked that the so-called Koch reaction was only a rediscovery of what Jenner had described and which was now regarded simply as an allergic reaction not related to immunity. Dr. North pointed out that the term "allergy" covered two distinct reactions—bacterial allergy and anaphylactic allergy. The latter tended to appear immediately after injection of a foreign protein, whereas the "immune reaction" did not appear for some two days and anaphylactic allergy, unlike bacterial allergy, was transferable. The question was of importance in reading Mantoux tests, as it was necessary to distinguish between the early anaphylactic reaction and the true Mantoux reaction.

DR. J. L. O'CONNOR (Melbourne) said that he was pessimistic regarding the Australian position in relation to smallpox because of the amount of that disease in Java, with which the Commonwealth had considerable air traffic—at present there being about 150 travellers per week between Darwin and Jakarta. Those travellers were all vaccinated, but while a sea-borne patient with smallpox arriving in Australia would almost certainly manifest a developed condition, an air-borne infected person could arrive within a few hours of infection and pass the most rigid inspection, and, if such a person had been vaccinated, he would have a modified form of smallpox very difficult to diagnose, especially as an isolated instance. Cases of that sort, he considered, constituted the greatest risk to the Commonwealth and the onus of detecting such cases had passed from the health officer to the doctor in practice. He stressed the need for alertness by all practitioners confronted with obscure rashes in persons who had recently arrived from overseas.

Speaking of microdiagnosis, Dr. O'Connor said that the size of the smallpox virus was such that it was at just about the limit of resolution of the ordinary microscope and, as the virus of chickenpox was very little larger, technically it was difficult to distinguish between them. Distinction could be made with an electron microscope, but that instrument was not generally available. Dr. O'Connor considered that the complement-fixation test was of value in the detection of virus present in lesions, but if effective results were to be obtained a considerable concentration of virus had to be present in the lesions. Present work on agglutination was interesting, but the test was a late one. Fenner's work on mouse pox indicated that there must be a considerable amount of circulating virus in the blood-stream in cases of smallpox, but growth of virus on chick embryo required nine to twelve days for results.

DR. A. FRYBERG (Brisbane) said that while Dr. O'Connor feared danger from air travellers, he himself thought that there was just as much danger from sea travellers, as with modern fast vessels two States could receive such travellers within the period of incubation of smallpox. He asked whether Dr. Park advocated the compulsory vaccination of all travellers entering Australia.

PROFESSOR A. H. BALDWIN (Sydney) said that in Sydney fifth year students and staff members were vaccinated. The students "took" and the staff members had so-called "immune reactions". In vaccination a live virus and a foreign protein were given, and, if the virus had died, it was still possible to have a protein reaction. He asked for guidance regarding the vaccination of contacts and whether vaccination was of any use late in the incubation period of smallpox.

Dr. Park, in reply, said that Wilkinson, of Hong Kong, was an astute observer, but he was dealing with a severe epidemic of Asiatic smallpox. He would accept Wilkinson's statement that vaccination was good for only two years, especially in that part of the world. An expert committee of the World Health Organization had concluded that it was impossible to develop objective criteria of the "immune reaction" and had difficulty in deciding what was an "immune reaction". In susceptible persons, killed lymph produced a reaction indistinguishable from the "immune reaction", and the committee considered that there was no justification for the retention of the term on the "International Certificate of Vaccination". Personal experience had shown that the use of a different strain for a fresh vaccination, after many revaccinations leading to "immune reactions", could be followed by an almost typical "primary" reaction. In his opinion a certificate of "immune reaction" should be regarded as valid for only six months. He thought that in future it might be necessary to hold all new arrivals in capital cities, where facilities for diagnosis by experts existed, until the period of risk had passed, and he agreed with Dr. Fryberg that vaccination certificates should be required of all persons entering Australia by all routes. He did not think that after a certain time in the incubation period vaccination gave protection, but he still advocated the vaccination of all contacts.

Section of Pathology, Bacteriology and Biochemistry.[1]

President: R. Webster, D.Sc., M.D., F.R.A.C.P., Victoria.

Vice-Presidents: B. C. Cohen, M.B., B.S., Western Australia; Marjorie Little, B.Sc., M.B., F.R.A.C.P., New South Wales; I. M. Mackerras, B.Sc., M.B., Ch.M., Queensland; Professor J. S. Robertson, M.B., D.Sc., D.Ph., South Australia.

Honorary Secretary: N. M. Gutteridge, E.D., M.B., B.S., Queensland.

President's Address.

DR. REGINALD WEBSTER in his president's address discussed perspective in pathology. After some introductory remarks in which he referred to his conviction that morbid anatomy had always been and must remain the corner stone of the edifice of clinical medicine, he went on to deal with his subject—clinical pathology. By this term he meant the application of laboratory methods of all kinds to the solution of specific and frequently pressing problems relating to diagnosis, and to an increasing extent, the control of the treatment of disease. If a practitioner ventured on clinical pathology as a specialty, he should be well versed in the practical application of histology, microbiology, biochemistry and hæmatology, and should recognize that for much of the technical details he would be obliged to rely on trained workers. Dr.

[1] The meetings held by the Section of Pathology, Bacteriology and Biochemistry with the Section of Public Health, Tuberculosis, Tropical Medicine and Industrial Medicine have been recorded.

Webster held that a clinical pathologist was entitled to a status much above that of an exalted technician; competent to advise on the diagnosis and treatment of all such forms of illness as fell within his province, he should be recognized as a consultant of standing equal to that of consultants in other spheres of medical practice.

In the social expansion which was taking place the demands for competent pathologists in the specialty of clinical pathology might be expected to grow and the training of pathologists became an urgent and complex question. It was a problem of the present. Dr. Webster expressed his approval of a curriculum for the training of consultants in clinical pathology drawn up in England in 1947 by a committee of the Association of Clinical Pathologists. It included one year of post-registration clinical experience, one year in a university department and two years in an adequately staffed and equipped department of clinical pathology. For Australian graduates it was desirable to add to this a year's travel abroad to gain further knowledge and experience, and the possession of a senior medical qualification was more than desirable. The economic position of trainees had to be considered, and therefore a generous system of scholarships or grants should be incorporated in any sound national health service.

Dr. Webster then went on to discuss science in medicine and said that to embark on a long series of laboratory examinations without an adequate clinical history was the very negation of the scientific method. He did not suggest that diagnosis based on the facts of the illness, supplemented by the information gleaned by practised examination, could ever be other than provisional, but in the interests of both patients and laboratory workers he would emphasize the fact that methodical and routine exploitation of the possibilities inherent in careful history taking would do much to ensure that subsequent laboratory procedures were well directed and would effect a progressive diminution in the number of those which partook of the nature of a bow drawn at a venture. Dr. Webster thought that there were times when rule of thumb procedures yielded results of little value and expressed the opinion that the spreading tree of hospital laboratory routine required some pruning. Opinions would differ as to what was dead wood and who should do the pruning; if pathologists were to initiate a few economies they would probably find acceptance. In his concluding remarks Dr. Webster insisted that the clinical approach to medicine was the best guarantee that laboratory investigation would be rationally and economically directed. It was also highly desirable that a hospital pathologist should not be fettered to a laboratory bench, but that he should be invited to study clinical problems in the wards and to offer his suggestions as a consultant specialist in laboratory diagnosis. The department of pathology was not "the last court of appeal", but was contributory to the sum of evidence to be sifted at the clinico-pathological conference which should find a place in every hospital calendar.

Moles and Melanoblastomata.

DR. V. J. MCGOVERN (Sydney) read a paper on moles and melanoblastomata. He said that a nævus or mole was a benign lesion appearing at or after birth and of varying clinical appearance; but the histological appearance was always one of nævus cells accompanied in some cases by pigment. A melanoblastoma was the malignant form; it was composed of malignant melanoblasts from the region of the basal layer of the epidermis. Persons with pale skins who freckled easily were predisposed to the development of melanoblastomata; any person with a pigmented nævus was a potential sufferer. Fortunately the incidence of malignant change in pigmented moles was low. Melanoblastomata made up about 0·8% of malignant conditions. Benign moles and melanoblastomata occurred frequently on the face and neck and in the skin of the trunk. Around the genitalia and upon the hands and feet benign pigmented nævi were uncommon, and melanoblastomata were fairly frequent. Recurrent trauma might produce malignant change in a benign lesion; but there was no evidence that a single surgical incursion had ever done so. However, it appeared that surgical intervention might hasten the dissemination of an already malignant mole. Other adverse factors were hormonal. The juvenile melanoma appeared malignant on histological grounds, but metastasized only rarely; however, it might become clinically malignant at puberty. Pregnancy also intensified the malignancy of a melanoblastoma. The transformation of a benign pigmented nævus into a malignant tumour was recognizable by one of four criteria: (i) deepening of the colour (often to blue or black); (ii) enlargement of the lesion; (iii) ulceration (a comparatively late sign); (iv) the formation of satellite growths or the discovery of distant metastases. The spread of skin melanoblastomata was first by the lymphatics and later by the blood channels. Dr. McGovern then discussed in detail the formation of moles, and showed a number of slides to illustrate the clinical features and the histological characteristics. Referring to treatment, he said that irradiation was useless. The best procedure was wide excision, removal of the regional lymph nodes and dissection of the intervening lymphatics. The following rules of treatment should be observed: (i) If the patient exhibited one of the clinical criteria of malignancy in a junction nævus (the term "junction" being derived from the site of the melanoblasts at the junction of dermis and epidermis), then radical operation was indicated. (ii) If the lesion was large and would require a plastic repair after excision, any doubt might be resolved by biopsy of a portion; there was no danger of precipitating malignant change in a benign lesion. (iii) Soft moles should be left alone unless they were unsightly, as hairy and warty moles might be. (iv) A microscopic examination of excised tissue should always be made. (v) The pathologist should always be told the age of the patient, so that he might give the correct interpretation of a juvenile non-metastasizing melanoma.

DR. J. V. DUHIG (Brisbane), in opening the discussion, said that all the modern views had been presented in the paper, but there were certain aspects to which he wished to draw attention. He agreed that simple nævi were always benign, and he thought that the recent suggestion of Allen that simple nævi should be called dermal nævi should be adopted. Malignant melanomata presented no problem, provided that the criteria laid down in Dr. McGovern's paper were observed. Dr. Duhig agreed that the only treatment was wide excision. With regard to the problem of the so-called "junctional nævus", he drew attention to a key paper written by Spencer in 1923. Spencer showed that the melanoblast originated as part of the basal layer of the epidermis. His diagrams showed that some melanoblasts sent processes into the dermis, and from those true nævi arose, both junctional and dermal nævi. In the dermal nævus the cells became separated from the mother cell and went on proliferating. Most were non-pigmented, but in some there might be deposits of pigment. Those were benign. The so-called junctional nævus was potentially malignant, and as there were progressive changes in the histological appearance throughout life, it was important for the histologist to know the age of the patient. Dr. Duhig thought that the number of cells proliferating at the junction, the presence of mitotic figures and the pressure of fibrils and nerve-like elements were important when the malignancy of the tumour was being assessed. He referred to the spindle-cell type of malignant melanoma. In most instances the diagnosis of malignancy was made after correlation of the clinical and histological findings.

Dr. Duhig said that junctional proliferation in adult life did not necessarily indicate malignancy. The appearances varied according to the location of the tumour and to the number of sweat glands and hair follicles present. He drew attention to the perifollicular and periglandular distribution of nævus cells. He pointed out that the fundamental ætiology of moles and melanomata was not yet known, and stressed the possible hormonal influence and the necessity for a biochemical approach to the problem.

DR. J. C. BELISARIO (Sydney) said that he would like the term "melanoblastoma" to include all soft nævi or moles. He agreed with Dr. McGovern in his remarks on the

formation of malignant melanomata. He referred to what he had seen in America, and went on to remark that biopsy was essential, and that it did not predispose a simple tumour to malignant changes. Intradermal nævi never became malignant, but junctional nævi did. Dr. Belisario stressed the fact that the report on the biopsy should be made within forty-eight hours, so that adequate treatment could be carried out in cases of malignant change.

DR. J. M. DWYER (Adelaide) referred to an article which had appeared in *Science* on the control of pigment by the pineal gland in fishes, stressing the hormonal control of pigmentation.

Sclerosing Angiomata.

PROFESSOR A. J. CANNY (Brisbane) read a paper on sclerosing angiomata. He said that they were a fairly common group of tumours, which seemed to involve the dermis more frequently than other tissues, but which were by no means confined to that site. Their essential derivation from vascular endothelium had been overlooked by many pathologists, who, because of certain secondary structural alterations to which such growths were prone, had designated them "histiocytomata", or because of their slight tendency to form well-defined vascular channels, had regarded the spindle-shaped endothelial cells constituting the essential neoplastic tissue as fibroblasts, neurilemmal cells or sarcomatous elements of ill-defined origin. Professor Canny went on to say that the most important secondary changes found in the sclerosing angiomata were the ultimate progressive fibrosis from which the lesion derived its name, and variable degrees of intracellular storage of lipoid and of hæmosiderin. The colour assumed by any growth was dependent on the relative and absolute amounts of lipoid and iron-containing pigment stored within it. If the former was predominant, the appearance might simulate that of xanthomata, both to the unaided eye and with the help of the microscope. If iron-containing pigment was predominant, a melanoma might be suggested, not only by the gross appearance of the growth, but even in the case of pleomorphic types by the histological structure. Although such errors should not occur if the essential structure of the sclerosing angiomata was appreciated, they did arise with disturbing frequency. As only rare and doubtful instances of metastasis from even the most rapidly growing angiomata of that type had been reported, and as the growths were naturally self-limiting, the significance of a false diagnosis of melanoma could easily be appreciated. An occasional tumour would break down blood pigment with remarkable speed; from the growth the pigment was carried by macrophages to nearby lymphatics and ultimately to the regional lymph nodes, where it accumulated within the sinuses in such quantity that the nodes were enlarged and dark brown. Unless the pigmentation of the nodes was recognized as hæmatogenous, metastasis of a melanoma was occasionally diagnosed. Professor Canny said that such consideration suggested that an awareness of the great range of minute structural variation shown by the sclerosing angiomata was important, not only from the academic point of view, but as a means of avoiding confusion with the melanomata.

PROFESSOR J. ROBERTSON (Adelaide) said that sclerosing angiomata were interesting tumours which he had not often seen. He found difficulty in nomenclature. He thought that those conditions might not be tumours at all, but possibly primary malformations or other tumours with blood vessels in them. They might even be adenocarcinomata with blood in the cell spaces. He wondered whether they represented an anaplasia from endothelial cells or from some cells more primitive. He said that the origin of the fat was somewhat obscure, and he pointed out that the tumours were not very vascular, and that there were no areas of hæmorrhage. There were no red cells in the giant cell. It was difficult, therefore, to understand where the blood came from. He stressed the importance of carrying out in the examination of pigmental dermal tumours the Prussian blue test—a test easy to do, seldom done.

Professor Canny, in reply, said that he had been asked to explain where the hæmosiderin came from. Hæmorrhages were found sometimes in some of the more cellular tumours, but they were so rare that they were probably not the source of the hæmosiderin. Hæmorrhages were more pronounced in the rapidly growing types of tumours. He did not know what was the behaviour of the essential components of the tumour. The tumour cells might be derived from multipotential mesenchymal cells or from cells already destined to be endothelial cells. They did occasionally form small vessels which established communication with the main vascular channels. Presumably it was from the end ramifications of the local vascular tree that the endothelial cells derived their pigment. It was possible that the hæmosiderin might originate from the oft-repeated microscopic hæmorrhages and subsequent breakdown of the escaped cells.

The Micropathology of Poliomyelitis.

DR. REGINALD WEBSTER (Melbourne) read a paper on the micropathology of poliomyelitis. He gave a demonstration of the morbid histology of poliomyelitis from lantern slides derived partly from the experimental disease, and partly from children who died in the Victorian epidemic of 1937.

The photomicrographic projections illustrated: (i) perivascular cell collars; (ii) interstitial inflammatory reaction, (*a*) diffuse, (*b*) focal; (iii) all degrees of damage to nerve cells; (iv) neuronophagia; (v) lesions in the posterior root ganglion; (vi) meningeal reaction.

In discussing the slides, he emphasized the following points:

1. The inflammatory changes, though conspicuous, were the result of the essential lesion rather than its cause.
2. The "pathological unit" in poliomyelitis was neuronal damage and destruction, upon which supervened the reactive inflammatory process.
3. Death of the neurons was due to the immediate and primary attack of the virus upon them, and was not a secondary effect of the vascular lesions.
4. Necrosis of nerve cells might ensue with extreme rapidity.
5. The incidence of the virus attack on the neurons was irregular, and this feature of the morbid histology had a bearing on the varying degrees of recovery observed clinically.
6. The changes observed in the posterior root ganglion were constant and significant.
7. The meningeal cellular reaction was not necessarily indicative of a specific inflammatory affection of the meninges.

Dr. Webster presented a brief review of new facts relating to the natural history of the disease as affecting the portal of infection, the distribution of virus within the body, its elimination, and the vehicles and channels of its dissemination. He discussed spread within the body as viewed by (*a*) the "systemic" school of opinion and (*b*) the protagonists of the doctrine of "axonal spread". Many phases of the epidemiology of the disease were still in the melting pot of speculation and research.

DR. J. DUHIG (Brisbane) said that Dr. Webster had fully covered the pathology of the disease. The virus was always intracellular and spread along the axis cylinders. The problem to be solved was that of the pathogenesis of the disease. He asked Dr. Webster whether he thought that the disease was caused by a single virus or whether different strains were responsible. He thought that as the virus was so widespread the disease must be one of low virulence.

DR. C. GRAHAM (Sydney) said that he thought that the perivascular changes in the cord described by Dr. Webster might be common to several diseases. It was difficult to make a diagnosis from post-mortem material when the clinical picture had been atypical. Dr. Graham asked Dr. Webster whether the changes in the posterior ganglia would be of help in making a differential diagnosis microscopically.

DR. H. MCLAURINAN (Melbourne) said that although Dr. Webster had described to the fullest extent the microscopic changes in the cord, he thought that those findings did not always correspond to the clinical signs and symptoms. In his experience he had found little sensory disturbance. If pronounced hyperæsthesia was present, he would doubt the diagnosis of poliomyelitis. He doubted whether the lesions as shown in the pathological specimen corresponded accurately with the segmental distribution of the lesions. As all pathological specimens were obtained from patients who had died, the picture as seen might not be the true one.

DR. ERIC SUSMAN (Sydney) said that Dr. Webster had convinced him that the disease was much more diffuse than had been previously thought and that it was not only a lower motor neuron disease. Dr. Susman asked Dr. Webster if he would refer to the cytological changes in the cerebro-spinal fluid; and were they transient or permanent? He also asked Dr. Webster to discuss the protein content of the cerebro-spinal fluiud.

Dr. Webster, in reply to Dr. Duhig, said he thought that a group of viruses was concerned. The various patterns of the epidemics supported that view. Dr. Webster then reviewed the work up to the present time on the pathway by which the virus was spread through the body. He said that there seemed to be no doubt at the present time that the spread was by neural pathways and that the virus was present in the alimentary tract and in the intraspinal contents. The part of the central nervous system first attacked depended on the neural pathways involved. In immunization experiments in America with poliomyelitis vaccine, 12 cases of accidental infection occurred. In those, the level of the cord first affected corresponded to the limbs into which the injection of the vaccine was made. The possibility of dissemination of the virus by lymphatic channels had once more been raised.

Lymphatic Absorption from the Peritoneal Cavity.

DR. F. C. COURTICE (Sydney) read a paper on lymphatic absorption from the peritoneal cavity, in which he described experiments on animals and made reference to the clinical application of the results. He said that since in clinical ascites the protein content of the ascitic fluid was often about 2% to 4%, the lymphatics must play a considerable part in absorption. The lymphatic pathways of absorption had been determined in cats after the intraperitoneal injection of homologous plasma to which the dye T-1824 had been added. The dye combined with the plasma albumin and was absorbed as a dye-protein complex. Thus if the lymphatic absorption of dye was estimated, a measure of the protein absorption was obtained. It had been shown that if the thoracic and right lymph ducts were cannulated, on the average about 20% of the dye-protein was absorbed by the thoracic duct and about 80% by the right lymph duct. The main area of absorption was the diaphragmatic peritoneum, and from the diaphragmatic lymphatics the lymph passed along the parasternal lymphatics to the lymph nodes near the thymus and from those mainly to the right lymph duct. The rate of absorption from the peritoneal cavity of a protein-rich fluid, homologous plasma, was more rapid in the rabbit, the guinea-pig and the rat than was isotonic saline. The protein changes in the peritoneal fluid had been determined at intervals, and the probable reasons for that phenomenon were discussed. Dr. Courtice said that if heterologous plasma was introduced, absorption might be greatly slowed, owing probably to a higher osmotic effect of the plasma proteins, for example, in bovine plasma. But once the fluid had been diluted by that effect, then absorption was rapid. The experiments probably explained the current belief that isotonic saline could be absorbed more rapidly than plasma. Dr. Courtice went on to say that during absorption of the plasma along the anterior mediastinal lymphatics, some of the lymph escaped from the lymph vessels and an excess of pleural fluid was found. If the two parasternal lymphatics were ligated, the excess of pleural fluid was much greater. It seemed therefore that the lymph nodes might normally act as a bottle-neck, so that the force propelling the lymph alone—respiratory movement—raised the lymph pressure, allowing some to escape into the mediastinal tissues and into the pleural cavities. Respiratory movement played an important part in the rate of absorption, the contraction and relaxation of the diaphragm aiding the movement of fluid into the diaphragmatic lymphatics, and the respiratory movement propelling the lymph along. Blockage of the parasternal lymphatics greatly decreased absorption, but increased the fluid in the mediastinum and pleural cavities. Posture also played a part, since protein absorption was slower in animals kept at an angle of 45° to the horizontal, pelvis down. On the basis of his experimental work, Dr. Courtice stated the following conclusions: (i) In the production of ascites, it seemed that absorption was probably rapid, so that ascitic fluid would not accumulate until the later stages of the disease. (ii) Intraperitoneal injection of blood had been used in the treatment of children, and it seemed that the intraperitoneal route for the administration of plasma or proteins might be possible in certain cases. (iii) In the experiments, the rapid lymphatic absorption of homologous plasma and therefore of other substances or particles such as viruses was interesting. (iv) The presence of pleural fluid in certain cases of ascites might in part be due to the phenomenon that had been described.

PROFESSOR J. S. ROBERTSON (Adelaide) said that the passage of red blood corpuscles and carbon and other large particles from the peritoneum to the lymphatics was very rapid. Up to 40% of red cells injected intraperitoneally could reach the circulation. He asked whether the use of Fowler's position in surgery might be helpful. Dr. Courtice's graphs showed that the absorption of fluid from the peritoneum was delayed when the patient was tilted upwards.

DR. R. J. WALSH (Sydney), in discussing the practical possibilities, suggested that the peritoneum might be used for the administration of protein solutions and drugs, especially homologous protein. He asked whether there was a risk of pleural effusion if such a route was adopted, whether there was reverse absorption of pleural effusion into the peritoneum, and whether the rate of absorption was determined by the nature of the protein, particularly its molecular weight.

DR. A. E. SHAW (Brisbane) referred to a case of nutritional œdema with ascites, in which two gallons of fluid had been removed. The serum protein was 4·2 grammes *per centum* and the administration of two litres of serum abolished the ascites. Dr. Shaw thought that the serum protein level should be taken into account.

DR. MAX LAKE (Brisbane) asked if Dr. Courtice could explain the mechanism of pleural effusion in ovarian fibromata.

DR. P. FANTL (Melbourne) said that he was interested in the subject in relation to the control of hæmorrhagic disorders. He asked whether the plasma used contained fibrinogen, and whether the cell count of the pleural fluid had been considered.

DR. V. WYNN (Melbourne) asked Dr. Courtice if he could explain the origin of ascites in cirrhosis of the liver.

Dr. Courtice, in reply to Dr. Walsh, said that in rabbits the pleural effusion was only temporary. In rats, foreign protein was necessary to produce such a pleural effusion. There was no reverse absorption through the diaphragm. When whole blood was used the plasma was rapidly absorbed, red blood corpuscles being left in the peritoneal tissues; the corpuscles disappeared in forty-eight hours. A spill-over into the pleura was never noticed. The experimental difficulties in the absorption of proteins of different molecular weights were great. The molecular weight was determined by so many factors that chemists could not guarantee a substance of known molecular weight to be used in such experiments. Pure albumin and whole plasma only had been used so far. All protein

molecules, which were small compared with red blood cells, were probably rapidly absorbed. The bottle-neck seemed to be in the thoracic and cervical lymph nodes. In reply to Dr. Shaw, Dr. Courtice said that the cause of œdema in nutritional œdema was still unknown. Drainage of ascites in such cases was a plasma phoresis. In reply to Dr. Fantl, he staid that heparinized plasma had been used. Cell counts in the peritoneal fluid had been made, and the cellular reactions to various infections were being investigated. In reply to Professor Robertson, Dr. Courtice said that Fowler's position was based on false premises. In reply to Dr. Wynn, he said that in cirrhosis of the liver there was an increase in portal pressure, and one of the main causes was an imbalance in the hydrostatic pressure in the portal area.

An Anti-Insulin Factor in the Plasma of Diabetic Patients.

DR. J. BORNSTEIN and MISS PHYLLIS TREWHELLA (Melbourne) presented the results of an investigation into the presence of an anti-insulin factor in the plasma of diabetic patients. They used alloxan-diabetic, hypophysectomized, adrenalectomized rats ("A.D.H.A." rats), which they said were extremely sensitive to all substances influencing the blood sugar level. The object was to determine whether plasma obtained from diabetic patients had any effect on the sensitivity to insulin of such animals. The patients studied were in three groups: (i) eleven unselected untreated diabetic patients; (ii) four unselected diabetic patients whose condition had been stabilized; (iii) two insulin-resistant diabetic patients. The technique used was described in detail. The experiments showed that plasma from eight patients in the first group, and from two patients in the third group, when injected into "A.D.H.A." rats, produced in each instance resistance to a normally effective dose of insulin. The duration of the resistance varied up to six weeks. In the patients mentioned, insulin as assayed by Bornstein's method was absent from the plasma. Plasma from three patients in the first group, and from four patients in the second group, which contained insulin either normally or as the result of injection of insulin, failed to produce insulin resistance in the animals. As it had been previously shown that plasma from such patients as those in the first group had no directly destructive effect on insulin, it was considered that the insulin resistance produced was due to an action on the tissues of the experimental animals. The fact that this effect could not be produced by the plasma of diabetic patients whose condition was stable with insulin suggested that, whatever the antagonistic factor might be, it was "neutralized" by the administration of excess insulin. However, it was possible that those patients fell into the same category as three patients in the first group who had normal concentrations of insulin present. Some attempt had been made to identify the nature of the "factor", but without success. The number of patients investigated was not large enough to indicate whether the factor played a significant role in the majority of diabetic patients.

DR. E. SINGER (Brisbane) said that there were various possibilities to explain the insulin inhibition described by Dr. Bornstein. The inhibiting substance might be a hormone, or a complex enzymatic process, or an antibody reaction. Simple chemical substances might produce antibodies, and insulin a polypeptide could also produce antibodies. Antibodies to hormones could be produced. Colloidal insulin *plus* an adjuvant would produce an antibody. Insulin could not be neutralized in an intact animal, but it might be neutralized in the experimental animal. The six weeks' interval was suggestive of antibody formation.

Dr. Bornstein, in reply, discussed the possibilities put forward by Dr. Singer. He thought that the substance was not a hormone and that an enzymatic process would have to be too complicated. It was known that the inhibiting substance did not keep at room temperature, and that it was destroyed by heat at 50° C. He thought also that an antibody reaction would have to be too complicated. He had been unable to isolate the substance, and at the present moment he had no idea what the substance was.

Iron Metabolism.

DR. R. J. WALSH (Sydney) read a paper on iron metabolism. He said that the absorption of iron was regulated in accordance with the needs of the body. The mechanism concerned appeared to reside in the gastro-intestinal mucosa, and was influenced by food and gastric acidity. Serum iron was bound to a specific β-globulin normally present in excess. Measurement of the percentage saturation of that protein and of the serum iron in various conditions had revealed striking differences. Iron deficiency anæmia could be distinguished from the anæmia of infection, and hæmochromatosis could be diagnosed at an early stage. The appearance of injected radio-active iron in the circulating erythrocytes was in normal circumstances a measure of the iron reserves of the body. Dr. Walsh finally discussed the physiological basis of intravenous iron therapy. He pointed out that there was no rational basis for the use of intravenous iron therapy when the basic fault in the metabolism was the inability to utilize available iron, or a failure to manufacture red cells. The only syndromes in which its use appeared to be justified were those associated with malabsorption.

DR. T. E. LOWE (Melbourne), in opening the discussion, thanked Dr. Walsh for drawing attention to a new clinical test in the investigation of anæmia, especially anæmias of iron-deficiency type. That type of investigation gave a clue to what was occurring in the patient, but did not give a lead as to treatment. Dr. Walsh had made one or two points which cut across established concepts of iron metabolism. (i) Ferratin and hæmosiderin were tervalent iron compounds, and represented the end-products of oxidoreduction. So far as Dr. Lowe was aware, no mechanism had been demonstrated which would convert the ferric back to the ferrous iron. (ii) With regard to hæmoglobin, Dr. Lowe said that Whipple did not consider the iron of hæmoglobin available for hæmoglobin synthesis, and he asked how that fact could be correlated with the hypothesis put forward by Dr. Walsh. It was necessary, in dealing with the problem of iron metabolism and hæmoglobin formation, to view it in the perspective of the whole aspect of hæmoglobin formation. He asked Dr. Walsh how the trace elements like copper and cobalt fitted into the picture.

DR. W. E. KING (Melbourne) said that in hæmochromatosis before liver failure the iron in the liver cells appeared to have no deleterious effect on the cells. Iron could be demonstrated in the chorioid plexus, but there was no increase in the iron content of the cerebro-spinal fluid. In hæmochromatosis there was some mechanism which allowed of more ready absorption of iron. He believed that some other factor was involved besides iron. In hæmosiderosis the changes which occurred were relatively slight; there was fibrosis in the liver, which was exposed to a long-standing anoxæmia, and he thought that the liver cells were damaged because of that.

DR. I. M. MACKERRAS (Brisbane) asked Dr. Walsh where methæmalbumin fitted into the picture. He also asked whether there was any evidence as to how long hæmosiderin remained in the tissues. He thought that the hæmosiderin deposits might be only transitory, and that the statement that the anæmia of infection was due to failure in maturation of hæmoglobin was a little bold and sweeping. He knew of two infections in which there was definite evidence of erythrophagocytosis in the spleen, and he thought that in those infections the destruction of the red cells would account for the anæmia.

DR. P. FANTL (Melbourne) asked whether there was any parallelism between iron binding by proteins and the binding of other metals such as copper and calcium.

DR. A. E. SHAW (Brisbane) referred to the work of Shorr and others, which had been reported in *The Journal of Biological Chemistry* of December, 1948, on the presence of a vasodepressor material (VDM) in liver slices culti-

vated anaerobically. He asked Dr. Walsh whether there was any relationship between "VDM" and the ferratin-apoferratin complex.

Dr. Walsh, in reply to Dr. Lowe, said that in working with rats it was possible to load the animals with iron and then to see deposits of hæmosiderin and to obtain ferratin from the liver. If the rats were then bled at a rate sufficient to remove the iron, the hæmosiderin and the ferratin in the liver also disappeared. He thought it fair to assume that they had been used for hæmoglobin formation, although there was no definite proof. No work had been done on enzymes necessary for oxidoreduction. With regard to the availability of hæmoglobin iron, there was some evidence that the marrow showed preference for iron from hæmoglobin. Dr. Walsh thought that hæmoglobin iron was readily available. In reply to Dr. King, he said that little was known about the ætiology and pathogenesis of hæmochromatosis. Whether the iron played any part in liver damage was not yet determined. He could not say that the iron caused fibrosis. He thought that the iron deposits in the liver possibly occurred as a result of pancreatic damage. In reply to Dr. Mackerras, Dr. Walsh said he thought that there was a relationship between hæmosiderin and ferratin, although he could not say exactly what the relationship was. It was possible that the ferratin might be increased to a certain point and then hæmosiderin was deposited. There was no depletion of hæmosiderin before depletion of ferratin. In all probability there was a third component in the complex mechanism. Dr. Walsh agreed that the anæmia of infection might have a hæmolytic basis. He thought that the failure of iron maturation was a more likely cause of anæmia than chronic infections. With regard to the specificity of the iron-binding protein and its relationship to other metals, he said that the iron had preference and could displace copper, but that copper could not displace iron. Copper formed a blue colour with protein. There was some binding with zinc, but calcium was not involved with the iron-binding protein. In reply to Dr. Shaw, Dr. Walsh said that the work of Shorr and others had not been confirmed, and a relationship between the ferratin-apoferratin complex and the "VDM" factor was not proved.

Infection in Hospitals.

Staphylococcal Cross-Infection in Hospitals.

MISS PHYLLIS M. ROUNTREE (Sydney) read a paper on staphylococcal cross-infection in hospitals. She said that penicillin-resistant strains of *Staphylococcus pyogenes* isolated from hospital patients had increased in incidence in the past five years. Figures published in England and Australia during the preceding eighteen months showed that the incidence had reached a value of 50% to 60% of all strains of *Staphylococcus pyogenes* isolated from patients in hospital. Strains from hospital out-patients had not such a high percentage of penicillin-resistant organisms. During the past twelve months the incidence of strains resistant to both penicillin and streptomycin had risen in one hospital from 3·5% to 14·1%. Those resistant hospital strains belonged to only a few phage types, in contrast to the many types isolated from penicillin-sensitive strains. Miss Rountree discussed the possible pathways of staphylococcal cross-infection in hospitals. Two sets of data which might assist in an assessment of the relative importance of those pathways were presented; they related to the conversion of the nursing staff to nasal carriage of antibiotic-resistant strains on their entry into the hospital wards, and to the staphylococcal content of ward air during quiet periods and during bedmaking. Available evidence indicated that the patients' bedclothing was a potent source of staphylococci, which were disseminated into the air and dust during bedmaking.

Salmonella and Shigella Infections in Institutions for Children.

DR. E. SINGER (Brisbane) discussed salmonella and shigella infections in institutions for children. The subject of gastro-enteritis of infants and young children was complicated, and to avoid confusion he distinguished three groups: (i) epidemic infections mainly of immature and very young infants; (ii) epidemic infections of older infants and young children; (iii) sporadic infections. It seemed that most infections in the first group were due either to viruses or to coliform organisms of enhanced virulence. In the second and third groups organisms which could be classified were much more common, especially members of the salmonella and shigella groups; but in a disconcertingly large number of cases ordinary bacteriological investigations yielded negative results. Epidemics of the first type were rare in Brisbane; epidemics of the second and third types were too frequent. Dr. Singer mentioned investigations that had been proceeding into the ætiology, and said that since August, 1949, he had been trying to obtain an over-all epidemiological picture of the incidence of gastro-intestinal infection in children, so as to be able to place into proper perspective the infections which occurred within the hospital wards. He described the methods he had adopted in examining children at the Brisbane Children's Hospital, and said that comparisons had been made with the results of examination of children taken to the maternal and child welfare clinics or staying in children's homes. Discussing his findings, Dr. Singer said that the ætiology of gastro-enteritis in infants and young children presented a difficult problem, as a great number of pathogenic and potentially pathogenic organisms had to be considered. Even when a thorough bacterial examination was made, only a minority of all infections could be ascribed to specific organisms, which were generally recognized as capable of producing gastro-enteritis infections. The three most frequently found organisms in the clinical material under discussion were *Shigella paradysenteriæ Sonnei*, *Salmonella typhimurium* and *Shigella paradysenteriæ Flexneri* in that order. *Salmonella bovis morbificans* and *Shigella paradysenteriæ Flexneri* seemed to be more dangerous in a hospital ward than other organisms encountered, presumably because they were able to produce a higher proportion of severe infections. Dr. Singer also mentioned an attempt that had been made at chemoprophylaxis in an outbreak of *Shigella paradysenteriæ Sonnei* infections in a children's home. Although the dosage of sulphonamides approached the curative level, treatment did not seem to prevent the spread of infection within the community. Dr. Singer admitted that possibly the number of infections had been reduced and their severity lessened; but he thought that the results showed that sulphonamides were much less effective in the treatment of children than of adults.

Systemic Mycosis due to Monilia Albicans.

PROFESSOR J. V. DUHIG and DR. MARGARET MEAD (Brisbane) presented a paper on systemic mycosis due to *Monilia albicans*, based on the findings in four fatal cases that had occurred in 1948. The patients were infants admitted to the Brisbane Children's Hospital; they were of low vitality and were suffering from enterocolitis. All four received intravenous therapy with 5% glucose solution. In one case only was oral and œsophageal thrush present. It was pointed out that infection with *Monilia albicans* was generally thought to occur via the alimentary or respiratory tract, or by the intravenous route. Investigations in the four cases under discussion had failed to determine the route with certainty, but strongly suggested the intravenous route. The authors pointed out that monilæmia with mycotic abscesses in the viscera formed a pathological entity. The diagnosis depended on the awareness of the occurrence of the infection and on the cultural and microscopic findings, especially on the use of Gram's stain for suspected lesions.

Discussion.

DR. E. F. THOMSON (Sydney) said that it was interesting to note that at the present Congress there were four separate meetings on hospital infection: one in the section of pædiatrics, one in the section of obstetrics, one in the section of orthopædics, and the meeting at which they were then present. He wondered whether that interest in hospital infection was due to the fact that hospital infec-

tion was more common or whether it was because interest in investigation was keener. It was interesting to note that various types of organisms were involved in hospital infection, but that the hæmolytic streptococcus did not appear to be involved. Dr. Thomson wondered whether that was bound up with the fact that the streptococcus rarely showed resistance to antibiotics while the other organisms discussed did show that resistance. He referred to the widespread occurrence of the *Staphylococcus pyogenes* in the environment of a hospital. Probably the most important problem in connexion with hospital infection was its control, and every effort should be made to ensure that all forms of control were carried out.

DR. I. M. MACKERRAS (Brisbane) said that at the Queensland Institute of Medical Research the work on the intestinal infections would be continued. It was possible to trace the paths of the infections for those particular organisms. He thought that with regard to intestinal infections the spread in hospitals was not nearly at the same level as in previous years, because of improvements in technique and control. Epidemiological studies had helped control. In babies the problem of cross-infection was also less acute than previously. Dr. Mackerras referred to the different strains of organisms mentioned by Dr. Singer and to the complete inefficiency of the sulphonamides in the treatment of babies.

DR. MARJORIE LITTLE (Sydney) referred to the increase in monilial vaginitis in the community and said that it was extraordinary that there were not more cases similar to those described by Dr. Duhig. The source of such monilial infections in women was a matter of great conjecture. There was no evidence that infection came from the husband. She referred to the possibility of infection of the baby at confinement.

DR. JOSEPHINE MACKERRAS (Brisbane) asked Miss Rountree whether the nasal infections in the carriers were persistent. She referred to an outbreak of Flexner dysentery in an orphanage of 400 children in 1948. When the healthy children were examined, eight carriers were found among 32 children aged between nine months and three years, and nine carriers among 62 children aged between three and seven years. Despite that high carrier rate no further cases occurred.

DR. STEPHEN WILLIAMS (Sydney), referring to the importance of cross-infection, said that he did not think it was more common at the present time, but that people were taking more notice of it. He stressed the need for the education of hospital staffs and said that in each hospital there should be a standing cross-infection committee. He had found that in the prophylaxis of Sonne dysentery sulphaguanidine had been unsuccessful, but that phthalylsulphathiazole had been strikingly successful. He thought that the greatest danger was the patient with an unrecognized Sonne infection admitted to a general ward; he had seen 35 such cases in one year. Dr. Williams stressed the importance of pus and blood found in the stool on microscopic examination and urged the closest liaison with the nursing staff.

DR. J. V. DUHIG (Brisbane) agreed with Dr. Thomson on the importance of staphylococcal cross-infection. He decried the indiscriminate use of penicillin.

DR. IAN WOOD (Melbourne) said that he was not convinced that the glucose-saline solution had been the cause of the monilial infection as had been suggested. He agreed that cross-infection was less, but that more notice was being taken of it. Cross-infection could be controlled, as had been shown during the war. He was not convinced by the arguments about the restricted use of penicillin.

Miss P. M. Rountree, in reply to Dr. Josephine Mackerras, said that the nasal carriers had not been followed long enough as yet for a definite answer to be given. There seemed to be a group of people who were persistent nasal carriers of certain phage types of staphylococci. Miss Rountree pointed out that courses of instruction were held for nurses and sisters. She also said that in the general community the general practitioner could still use penicillin, as the problem of resistance occurred chiefly in hospitals. The resistant strains appeared to belong to a few phage types.

Dr. Duhig, in reply, said that he had not meant to imply that the main factor in the fatal result of his cases had been the monilial infection. The conclusions drawn as to the origin of the infection were only tentative and the question was still open. Dr. Duhig stressed the fact that when penicillin was used it should be used in adequate doses.

The Physiological and Pathological Significance of Fibrinolysis.

DR. P. FANTL (Melbourne) read a paper on fibrinolysis, which he defined as the disappearance of the fibrin clot either produced during intravascular coagulation or present in shed blood. Fibrin was a protein, and there was evidence indicating that fibrinolysis was due to the action of a proteolytic enzyme. It was essential, for effective hæmostasis, to produce a firm clot in a few minutes. On the other hand, liquefaction of fibrin should be a slow process. Intravascular coagulation might occur, with the production of thrombo-embolic complications, and some means for the rapid disintegration of a thrombus would be of value. Dr. Fantl said that it was that aspect of the problem which had attracted his attention, and he described in some detail the experimental work that had been done, both by himself and by other workers. From the experimental evidence it appeared that the inactive enzyme precursor called profibrinolysin occurred in circulating human blood and that, under the influence of certain stimuli, a tissue component entered the blood and combined with the precursor to form the enzyme which attacked fibrin only. Therefore the name fibrinolysin should be retained for the active principle. But full activity could not usually be observed in undiluted blood because there was in plasma an inhibitor of proteolytic enzymes. Fibrinolytic activity would therefore depend on the balance between activating and inhibitory factors. Fibrinolysis would be of value in the dissolution of a fibrin clot in thrombo-embolic conditions; obviously it would be better than the anticoagulant drugs in use, because they had little or no effect on an existing clot. Also, in view of the suggestion recently put forward by Duguid about the fibrinous origin of atheroma, the prevention of mural thrombi by fibrinolytic activity might be of prophylactic value in the prevention of athero-sclerotic changes. Moreover, the inhibition of fibrinolysin might be of clinical interest. It had been observed that severe hæmorrhagic shock might lead to the development of a potent fibrinolytic enzyme in the circulation, sometimes of such intensity that hæmostasis became impossible. Blood transfusions in such conditions were of no avail, because fibrin was destroyed as soon as it was formed. The application of anti-fibrinolysin to stop excessive fibrinolytic activity seemed to be a more promising therapeutic measure.

DR. T. E. LOWE (Melbourne) said that Dr. Fantl had demonstrated another step in the already complex machinery by which the body kept its blood fluid, but by which the blood could be made to clot when the necessity arose. He pointed out that even when the blood was contained within the endothelial lined vessels it tended to clot after a considerable time. He referred to recent observations in dogs after cardiac catheterization. There was apparently damage to the endothelium on the right side of the heart as the result of trauma from the catheter. At post-mortem examination fibrinous clots were seen at the site of the damage. Similar damage probably occurred in man when a catheter was passed into the heart, but no fibrinous clots formed because the anti-clotting mechanism came into action. He referred to Duguid's work on the possible mechanism of the formation of atheromatous plaques which it was suggested were formed as a result of the clotting of fibrin on the vessel wall. He said that he was not very impressed with this paper and suggested that hæmorrhage into the subintimal layer might be a more likely origin of atheromatous areas.

DR. J. A. MCLEAN (Melbourne) described the clinical details of his cases of post-partum hæmorrhage to which Dr. Fantl had referred. He pointed out that death occurred

even after temporary relief from direct transfusions. The blood from these patients did not clot in the test tube and he thought that the cases were true examples of fibrinolysis. He had no personal experience of toluidine blue, but he had seen it used in America in cases of acute leuchæmia without any good result. He thought that direct transfusion always stopped the bleeding in acute leuchæmia.

DR. A. E. SHAW (Brisbane) said that he thought the chief virtue of direct transfusion was the rate at which the transfusion was given. He referred to patients suffering from shock following tonsillectomy who had been given transfusions of fresh blood collected at the hospital. The hæmorrhage from the operation site ceased if half a litre was given in half an hour. When blood from the blood transfusion unit was used the same thing occurred, even though the blood had not been freshly collected. It was later found that serum acted in the same way. Dr. Shaw believed that that stressed the value of the albumin fraction of human serum. He considered that the rate of transfusion and the total quantity given were important factors in controlling severe hæmorrhage.

DR. V. WYNN (Melbourne) suggested that it was possible that the mechanism described by Dr. Fantl played a part in the phenomenon of post-operative emboli. He thought that an antifibrinolytic agent might be used.

Dr. Fantl, in reply to Dr. Wynn, said that he agreed with Dr. Wynn's statement. He thought that in the types of cases under discussion not much fibrinolytic enzyme was present. In practice emboli were not common in lung surgery.

The Heparin Protamine Test and its Clinical Significance.

DR. N. M. GUTTERIDGE (Brisbane) discussed the heparin protamine test, which he said offered a new approach to the study of some hæmorrhagic disorders and provided a basis for effective therapy. The basic factors for the study were three. (i) The factors controlling the fluidity or coagulation of the blood were in dynamic equilibrium, which was sometimes unstable. Some of those factors could be neutralized by corresponding opposing factors; one example was heparin and allied substances on the one hand and toluidine blue or protamine on the other. (ii) It was believed that heparin was produced by the granules of the mast cells in the connective tissue around the blood vessels. The granules had an affinity for basic aniline dyes. Toluidine blue, one of those dyes, was non-toxic in effective doses. (iii) When action was taken on the analogy that protamine stabilized insulin, it was found that protamine inactivated heparin immediately, both *in vitro* and *in vivo*. When increasing quantities of heparin were added to samples of freshly drawn venous blood, the graph obtained by plotting the increments of heparin against the coagulation time was a first order curve. In order to study the more sensitive part of that curve, the samples could be made incoagulable with a standard dose of heparin and then back-titrated with quantities of protamine sulphate increasing by 0·02 milligramme in each test tube. The coagulation end point was read in one hour. In many hæmorrhagic conditions it had been found that the end point was raised to the next strength of protamine sulphate. Whether the substance producing a positive result to the test and causing the hæmorrhagic state was heparin or an allied substance was not known. The heparin protamine test produced a positive result in a wide variety of hæmorrhagic disorders, and a degree of clinical improvement resulting from the neutralization *in vivo* of the condition revealed by the test would be limited according to the extent to which the increased circulating anticoagulant affected the overall clinical picture. Dr. Gutteridge went on to say that subjects in whose blood a raised protamine titration was detected could be classified into two groups—patients without evident disorders of the blood cells and patients with disorders of the blood cells. He quoted examples of conditions in each group, and several illustrative cases. In the first group he mentioned menorrhagia and delayed post-partum hæmorrhage, and in the second group acute and chronic leuchæmia, post-irradiation syndrome, Hodgkin's disease treated with nitrogen mustard, rheumatoid arthritis treated with preparations of gold, thrombocytopenic purpura and panhæmocytopenia (in the case of panhæmocytopenia the diagnosis of aplastic anæmia might have been correct). In all the cases quoted the exhibition of toluidine blue had been of great benefit. Dr. Gutteridge, in referring to the post-irradiation syndrome, pointed out that the intravenous injection of toluidine blue would be needed, in association with blood transfusion and penicillin, in the treatment of the delayed radiation effects that followed exposure to the effects of the atomic or hydrogen bomb. He concluded that the work on the heparin protamine test was an essential component of the medical defence against the new types of offensive missiles.

DR. R. J. WALSH (Sydney) said that they should be grateful to Dr. Gutteridge for having brought to the notice of the section a recent hæmatological advance. The matter which he had raised—the presence of a circulating anticoagulant in the blood-stream of certain patients—was particularly important in view of the current possibility that large numbers of people might at some future date be exposed to massive γ irradiation. Experience in the atomic bombing of Japan and in experimental irradiation of animals in the United States of America had shown that hæmorrhage was one of the most serious complications of excess irradiation, particularly from necrotic areas of the gastro-intestinal tract. More recently the finding of an anticoagulant in the circulation had led to an association of the hæmorrhage with the anticoagulant. Dr. Walsh asked whether there was justification for the assumption of a causal relationship. Certainly protamine sulphate and toluidine blue appeared to be effective therapeutically, but there was some evidence that the anticoagulant was not the immediate cause of the hæmorrhage. It would seem that in Dr. Gutteridge's cases no abnormality of the clotting mechanism had been demonstrated, except an increase in the protamine-precipitable material, assumed to be of a heparin-like nature. If the anticoagulant was in fact the cause of the hæmorrhages, Dr. Walsh would think that it would cause an increase simultaneously in the coagulation time. This had not been observed and Dr. Walsh would think that the reputed value of protamine and toluidine blue might be unconnected with the clotting mechanism.

Dr. Walsh then discussed the test itself. He said that during a recent visit to the United States he had had the opportunity of using the heparin protamine test as advocated by Allen *et alii*. His impression, and that of his colleagues at the time, was that it was not an easy test to perform and that the end points were often hard to read. They had thought that it was rather an inaccurate test and that the results should be treated with caution. Extreme alterations had, of course, been easy to read and to detect, but the minor variations, the very important aspects in ordinary clinical work, had been difficult to interpret. The complexity of heparin-like material in the body, lack of knowledge concerning the formation of such substances within the body and the almost complete ignorance of the physiological role of heparin and heparin-like materials as well as the fact that positive results to tests had not infrequently been observed in normal men and women, all made Dr. Walsh regard the test with a certain amount of suspicion. Whilst the work described by Dr. Gutteridge had opened up a new concept of hæmorrhage in man, it was perhaps a little unwise to accept its clinical implications without reserve. Hæmorrhage of the type described was undoubtedly a complex phenomenon and in recent years studies of the capillaries themselves had certainly incriminated the vessels. The work of McFarlane in Oxford had demonstrated the important part played by the capillary endothelium in thrombocytopenic purpura. The immunological similarity of the endothelium and platelets had been demonstrated and more recently an unknown fault had been shown to develop in some conditions in the capillary basement membrane. It was unwise therefore to regard the causation of hæmorrhages as being confined to the clotting mechanism of the blood. It seemed better to regard the blood changes as coincidental occurrences in the particular disease. Protamine

sulphate and toluidine blue were undoubtedly valuable in the treatment of excessive irradiation and apparently also in certain clinical conditions. Dr. Walsh thought that a word of warning would not be out of place against attempts to incriminate the so-called heparin-like substances in all hæmorrhagic states. Further fundamental studies would seem to be required of the whole problem of hæmostasis.

DR. P. FANTL (Melbourne) said that he had been interested to hear that Dr. Gutteridge had given protamine sulphate intramuscularly. He thought that the protamine sulphate would be broken down and would not reach the circulation at all. Dr. Fantl asked Dr. Gutteridge if the whole blood coagulation times had been estimated, because if there was a heparin-like substance in the circulation, the coagulation time should be delayed. He pointed out that if the hæmorrhagic state was not due to heparinæmia, the administration of protamine sulphate would aggravate the condition.

DR. B. C. COHEN (Perth) asked Dr. Gutteridge if any other dyes had been used, and referred to the use of Congo red in hæmoptysis. He thought that in the case of panhæmocytopenia the patient's condition would probably have improved without the administration of toluidine blue, because natural remissions were often seen in that type of case.

Dr. Gutteridge, in reply to Dr. Fantl, said that the coagulation times had been studied in some cases, and that in one case the coagulation time was twelve and a half minutes. He thought that there was no adequate test of coagulation time and that other tests, such as the estimation of fibrinogen, were more reliable. He said that protamine sulphate seemed to work clinically. In reply to Dr. Cohen, Dr. Gutteridge said that any basic aniline dye might be used, but many such dyes were extremely toxic. Toluidine blue seemed to be the safest.

The Flame Photometer Technique in Clinical Biochemistry.

DR. VICTOR WYNN (Melbourne), in discussing the flame photometer technique, said that in clinical biochemistry there was a great need for a rapid and accurate method for estimating sodium and potassium concentrations in biological fluids. The results of such analyses might provide much information upon which accurate assessment and treatment in cases of severe water and electrolyte imbalance could be based. In the past that information had not been readily available because of the time taken by the chemical techniques. That had led to the widespread use of methods of "prediction" in an attempt to obtain equivalent information without directly estimating the sodium and potassium concentrations. Thus the simply performed chloride titration was frequently used to "predict" the more important sodium value. That implied a constant ratio of sodium to chloride in the body fluids, and such an implication was frequently contrary to the physiological facts. Similarly the plasma bicarbonate value alone (alkali reserve) was used to "predict" the acid-base balance of the blood. But in the absence of precise knowledge of the sodium value the plasma bicarbonate value was capable of several different interpretations. Another example of a method of "prediction" was the use of the electrocardiogram as a guide to the distribution and total amount of the potassium ion. It was now recognized that the electrocardiogram could not be used safely in that way. Such methods of "prediction" involved dangerous assumptions in many cases. Equally dangerous might be the "hydration formula" and clinical "rules" which were used in an attempt to simplify the problems associated with the treatment of severe water and electrolyte imbalance. The high mortality associated with gross water and electrolyte imbalance demanded a more vigorous attack upon the problem than was generally the case. Adequate biochemical facilities to provide the relevant information at the time when it was required were essential for the proper management of such conditions. Sodium and potassium analyses were an important part of this information. Flame photometry was a method which enabled such analyses to be performed rapidly and accurately, and on small samples.

Discussing the principles of flame photometry, Dr. Wynn said that when an atomized vapour of an aqueous solution of any of the alkaline metals was introduced into a flame of appropriate temperature, the element emitted an atomic line spectrum of characteristic wave-length. The intensity of the spectral emission of the element was a function of its concentration, provided that steady flame conditions prevailed, that the vapour was introduced into the flame at a constant rate, and that other substances were not present in the solution which directly enhanced or depressed the spectral emission of the element under test. The concentration of the element in the test solution could be determined by comparing its spectral emission energy with that of a solution of known concentration.

Dr. Wynn described the four parts of a flame photometer and said that a number of factors interfered with the direct proportionality between the ionic concentration and the spectral emission energy of the element introduced into the flame. Such interference factors must be carefully worked out for each type of flame photometer. In biological work it was relatively easy to overcome the interference. The Beckman flame spectrophotometer, which was the instrument described, was suitable for clinical work. For plasma samples a single aliquot which might be as little as 0·2 millilitre was suitably diluted. The intensity of the sodium and potassium spectra was compared with that of solutions of known concentrations of those elements. The whole analysis could be completed in a few minutes, and the accuracy compared more than favourably with that of the usual chemical methods. Urine, cerebro-spinal fluid and intestinal secretions were equally readily analysed. Food, fæces and tissue analyses were also readily performed after the material had been freed of solid organic matter by a suitable ashing procedure.

PROFESSOR W. V. MACFARLANE (Brisbane) stressed the importance of precise and rapid methods for the estimation of sodium and potassium in the study of electrolyte imbalance. He thought that the flame photometer would become an indispensable instrument in such estimations.

Homologous Serum Hepatitis.

DR. R. J. WALSH (Sydney) read a paper on homologous serum hepatitis. He said that its occurrence and incidence in New South Wales had been investigated in a recent survey. There was evidence that the disease was occurring in a significant number (approximately 2·5%) of patients who received pooled human serum by transfusion, but that it was rare after blood transfusion. It was clinically similar to infectious or epidemic hepatitis and was thought to be of viral ætiology. Immunological differences between the two diseases suggested that two viruses or two distinct strains of one virus were involved. The incidence might be reduced by cautious use of serum, by preparing serum from small donor pools, or by fractionating serum. The virus might be destroyed in serum by ultraviolet irradiation or by chemical sterilization with purified nitrogen mustard.

DR. IAN WOOD (Melbourne) said that Dr. Walsh had shown that homologous serum hepatitis probably existed in Australia and that in most respects it followed the same ætiology and course as had been observed in England and America. Dr. Wood said that in the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital, ten cases of hepatitis had been studied which were possibly, or even probably, due to the virus of homologous serum jaundice. Eight of them followed a syringe and needle injection of various substances, one followed transfusion of serum and blood, and one followed blood transfusion alone. It was not possible, of course, to distinguish them definitely from hepatitis due to the virus of infectious hepatitis. The ten patients had, in common with infectious hepatitis, jaundice with the positive chemical finding of hepatocellular jaundice (elevated serum bilirubin content, positive response to the cephalin flocculation test and an alkaline phosphatase reading of less than 40 units), and in seven cases needle biopsy of the liver had revealed histological findings typical of virus infection.

Dr. Wood showed a table describing the ten possible cases of homologous serum hepatitis, and pointed out that the average age of the patients (thirty-seven years) was greater than the average age of a group of 45 patients with typical infectious hepatitis seen in the unit (average age twenty-nine years). Children aged under fourteen years had not been included in the series. Moreover, the probable incubation period also appeared to be in keeping with the observations made by Dr. Walsh and workers overseas. In most cases the infection was mild. There had been no deaths.

DR. M. J. J. O'REILLY (Brisbane) said that in Queensland, among 210 patients who had survived for six months after the administration of serum or serum and blood, there were three cases (1·5%) of homologous serum jaundice. Among patients who had received blood alone there were three cases of jaundice, but only one of these was a definite case of homologous serum jaundice. Dr. O'Reilly asked Dr. Walsh whether it was correct that the use of ultra-violet light in the eradication of the virus from serum had been unsuccessful in Copenhagen.

DR. STANLEY WILLIAMS (Melbourne) asked whether it might not be possible, in the cases mentioned by Dr. Ian Wood, that the arsenic acted as an irritant to the liver of a patient who was already harbouring the virus.

DR. JOSEPHINE MACKERRAS (Brisbane) asked Dr. Walsh whether there had been any follow-up examination of donors who were incubating the disease at the time when blood was taken from them. Dr. Mackerras also asked whether Dr. Walsh knew what was the clinical picture in a spontaneous case of homologous serum jaundice.

DR. NOEL GUTTERIDGE (Brisbane) referred to his visits to 57 transfusion services in America and Canada, and said that the Canadians were apprehensive about homologous serum jaundice. Dr. Gutteridge mentioned protein hydrolysates as a source of protein for intravenous alimentation in which there was no risk of viral infection. He had seen the apparatus for ultra-violet irradiation of serum, and he thought that in the process the serum might become contaminated with other organisms. He preferred the use of nitrogen mustard to destroy the virus in the serum, and said that the toxic nature of nitrogen mustard was altered when it was placed in the serum.

DR. J. COLEBATCH (Melbourne) asked if Dr. Walsh would give some information about the effect of homologous serum jaundice in childhood, and the mortality rate.

Dr. Walsh, in reply, said that Dr. O'Reilly's figures were lower than those of New South Wales, and that that might be due to the fact that the pools of serum used in Queensland were much smaller. It was perfectly true that the use of ultra-violet irradiation in Denmark had been unsuccessful, but that was in the early days of its use. The action of the ultra-violet light was to denature the virus, and the method had to be so perfected that the virus could be denatured without the protein in the serum being also denatured. Dr. Walsh said that Dr. J. Mackerras had raised an interesting point. He referred to one donor who said that she could not give blood because she had recently suffered from jaundice. The blood which had been taken from that donor during the incubation period of the jaundice was traced, and it was found that the recipient had developed jaundice after an incubation period of about three months. Dr. Walsh thought that spontaneous homologous serum hepatitis would be indistinguishable from infective hepatitis. In reply to Dr. Gutteridge, Dr. Walsh said that a warning with regard to the occurrence of homologous serum hepatitis had been issued in the monthly circular of the New South Wales Branch of the British Medical Association. He did not think that there would be any danger of contamination with other organisms during the process of ultra-violet light irradiation, because the irradiation would kill the other organisms as well as the virus. It was possibly true that nitrogen mustard was harmless, but he would prefer to await further evidence. In reply to Dr. Colebatch, Dr. Walsh said that he had had no personal experience of the disease in children, but in San Francisco the disease had occurred in children treated with serum for gastro-enteritis, and there had been four deaths.

Section of Naval, Military and Air Force Medicine and Surgery.

President: Surgeon Captain L. Lockwood, M.V.O., D.S.C., M.D., B.S., R.A.N., Victoria.
Vice-Presidents: J. M. Dwyer, E.D., M.B., B.S., South Australia; Colonel K. B. Fraser, E.D., M.B., M.S., F.R.A.C.S., K.H.S., Queensland; L. N. Gollan, M.B., B.S., Tasmania; Colonel A. M. McIntosh, B.A., M.B., Ch.M., F.R.A.C.S., New South Wales; Colonel J. H. Stubbe, E.D., M.B., B.S., F.R.F.P.S., Western Australia.
Honorary Secretary: Peter Row, M.B., B.S., F.R.C.S., Queensland.

President's Address.

SURGEON CAPTAIN L. LOCKWOOD (Melbourne) took as the subject of his president's address "The Ancient Precepts". He defined the function of the medical branch of a fighting service as the treatment of the sick and wounded; he said that in wider terms, that meant also the prevention of disease, the maintenance of robust health, the rehabilitation of the sick and wounded and their restoration to physical fitness. From that point of view Captain Lockwood went on to discuss briefly the pioneer work done by Dr. James Lind, who was of Scottish descent, and had been described as the father of nautical medicine. Dr. Lind had advocated and worked for great reforms, which included measures for the prevention in the Royal Navy of scurvy, dysentery and typhus, for the improvement of hygiene and of the clothing and general well-being of the men, for the prevention of malaria and yellow fever, and for the purification of drinking water. Lind's drastic reforms had come into being gradually; but the passage of time had proved the soundness of his ideas. It had fallen to the lot of Sir Gilbert Blane, another distinguished Scottish naval surgeon, to induce the Admiralty to put into effect the reforms advocated by Dr. James Lind. Another Scotsman, Thomas Trotter, had also played a great part in subduing baneful diseases endemic in the navy. Captain Lockwood then referred to an article by E. R. Boland, which had appeared in the *British Medical Journal* of July 3, 1948. Boland had advocated three main changes: (i) the removal of the army medical services from the control of the adjutant-general, with complete freedom of access to the councils of the commander-in-chief; (ii) amalgamation of the three separate medical services, or alternatively, standardization of procedure for all the services; (iii) provision for the promotion of a much greater proportion of medical officers to the higher ranks on the strength of their professional ability, so that they need not relinquish their professional pursuits in order to become administrators and thus ascend the normal ladder of promotion. Captain Lockwood mentioned the difficulties of amalgamation of the services, and pointed out that much duplication could be avoided by coordination. He urged service medical officers to take pride in the performances of their forebears, and to remember that what they were really respected for, and what their real work

was, simply meant the most efficient application of the healing art in the three services. They should, like their predecessors, not be deterred by difficulties and obstacles in their way, when they were confronted with problems associated with improvement of the treatment of the sick and wounded, and with the raising of the standard of the medical services.

DR. J. M. DWYER (Adelaide) emphasized the necessity for the amalgamation of the medical services of the army, navy and air force. He pointed out that in Great Britain each service document included the corresponding number of the appropriate document of other services.

DR. W. E. L. H. CROWTHER (Tasmania) congratulated the president on his choice of subject and said that he approved of the implied appeal for better coordination of the services. He felt that all were in agreement that men with higher qualifications should get appropriate rank. In the last war a big burden had fallen on the medical men who remained at home; they had to do not only their civil work, but also work for the Repatriation Department and for the various services, in addition to looking after men returned from overseas. Dr. Crowther remarked that it was most interesting to hear of the work of Lind. In Lind's days, the work of the surgeon was carried out on the orlop deck, which was below the waterline. When a ship went into action, there repaired to the orlop deck the surgeon and his mate and the carpenter and his mate, the one to repair the holes in the men and the other the holes in the ship.

DR. J. STUBBE (Perth) said that there was never such diversity of documentation and methods as in the British Commonwealth Occupational Forces in Japan. There were forces of four nations, Australia, New Zealand, India and the United Kingdom, each with its navy, army and air force; and the result was hopeless confusion.

DR. S. H. LOVELL (Sydney) added his congratulations. He said that life was a sprint rather than a distance race and that they should look forwards, never backwards. They should endeavour to amalgamate not only the medical services, but all the services, including pay and records. That was essential in any future total war, and of particular importance was the amalgamation of specialist hospitals maintained by the different services.

DR. GUY GRIFFITHS (Sydney) said that he was glad to hear an appreciation of Lind's work in the prevention of scurvy. Until lately he had been denied due recognition. This was largely due to William Osler, who had given all the credit to Captain Cook, without realizing that he was merely carrying out instructions of the senior officer of the navy.

DR. A. M. MCINTOSH (Sydney) expressed his appreciation of the address. He said that there was an impression abroad that Cook's prevention of scurvy was due entirely to his own efforts. Actually, he had had two medical officers with him, Dr. Monkhouse and Dr. Perry, to whom was no doubt largely attributable the preventive measures undertaken. Monkhouse had died in Sumatra from the queer epidemic which overtook Cook's crew, and the fate of Perry remained in doubt.

DR. K. B. FRASER (Brisbane) said that he was pleased that due credit had been given to the Scottish medical officers. They needed to be reminded of the lessons of the past. It was most important that they keep those alive and hand them on personally to their successors. Medical manpower was a real problem, but they should retain the administration of their own service in the hands of medical officers. He thought that not only commanding officers but also registrars of medical units should be medical men. They should strive towards amalgamation and, in particular, towards unifying and simplifying documentation in all the services.

Dr. Fraser moved and Dr. Stubbe seconded, and it was carried unanimously, that every consideration be given to complete standardization of all medical documentation throughout the medical services of the defence forces, and that the congress committee be requested to transmit the resolution to the chiefs of the medical services of the navy, army and air force in the Commonwealth.

Surgery in the Field.

DR. PETER ROW (Brisbane) read a paper entitled "Surgery in the Field". He said that the objects of military surgery were firstly the restoration to health of the fighting soldier so that he might fight again, and secondly the saving of life, the prevention of suffering, and the restoration to the nation of the best of its manhood, although a little battered. It was impossible to avoid being influenced by the second group of motives, which were humanitarian; but sight should not be lost of the primary object, since the more men who were restored to ability to fight, the shorter would be the war and the fewer the lives lost in the long run. Field surgery was the most important branch of military surgery, since upon its quality all that followed would depend. Dr. Row went on to discuss the siting of field surgical units according to the varying circumstances involved, and pointed out that the problem was a matter of time rather than of distance; the chief considerations were (i) the need for wounds to be treated operatively within the first twelve hours if the best results were to be obtained, and (ii) the fact that a number of seriously wounded men must be held for seven to ten days before evacuation. Dr. Row then described the establishment, organization and scale of equipment of a forward surgical unit, pointing out that those matters could hardly be rigidly defined; he based his remarks on general principles. He discussed the desirable qualifications of the surgeon, his "qualified" assistants and his "unqualified" assistants. The first consideration was that all personnel should be physically fit, and the second was intelligent and technically efficient team work. The most important consideration with regard to equipment was to make sure that, if large amounts of the equipment went astray or were not available for any reason, what was left was varied enough and adequate to enable the surgeon to carry on. In that regard the surgeon should thoroughly mix up and repack all the "Q" ordnance and medical stores according to his own tactical needs. The members of a surgical unit should know their equipment as a fighting soldier knew his weapons. Dr. Row then discussed the forward surgical unit at work, his chief points being the relation of the unit with other field units, sorting and resuscitation, and rate of work. He gave a brief account of the progress in field surgery from the days of Ambroise Paré, and pointed out that, given a good system of evacuation and a secure supply line, the wounded man had a much better chance now than formerly, though much still depended on those who carried him to the surgeon in good time. Finally Dr. Row referred to the difficulties associated with retreats, and deplored the mistake of working out everything on the assumption that there would be no retreats but only advances; he thought that he had detected such a tendency in recent articles dealing with the management of the wounded. He thought that, in the wars of the future, although weapons and methods might be very different, the principles of military surgery would remain the same, but would need modification.

DR. T. ACKLAND (Melbourne) said that the object of field surgery was to get a man with a minor wound back to his unit quickly. The presence of a satisfactory surgical unit in the area greatly helped the morale of the troops. Siting of the unit was important in order to minimize the time between the receiving of the wound and its treatment; the optimum time was less than twelve hours. One point Dr. Ackland wished to emphasize as very important was that there should never be only one surgeon serving in an area even when there were only a few casualties. Relief was essential. No man could function efficiently day after day without relief, and it was essential that there should be at least two in each unit.

DR. K. B. FRASER (Brisbane) said that it was important to pass on the lessons they had learned to the younger man coming after. It was important also to recruit suitable

people for the work. There was so much that could not be learned from books, but only by personal contact.

DR. W. LEMPRIERE (Melbourne) said that Dr. Row had presented a brilliant review of the subject and had omitted nothing of importance. He would like, however, to mention another type of surgeon, the "gramophone", who prattled constantly and prevented both his colleagues and his patients from getting any sleep.

DR. L. G. HILL (Brisbane) said that Dr. Row had an excellent record for his forward surgery, particularly for his eagerness to cooperate. He thought that lectures such as the one they had listened to should be printed for the instruction of general medical officers. He mentioned that the training of orderlies had been very difficult in the early stages of the war. Their duties in field units and in general hospitals differed entirely, and he considered that their training should be undertaken in peace time and should be particularly directed to developing their initiative.

DR. J. M. DWYER (Adelaide) referred to the proposal to form a Section of Aviation Medicine. He thought that that was inadvisable, but that rather they should amalgamate and be aware of one another's problems. In any case, there was now an air arm in the Royal Australian Navy as large as the Royal Australian Air Force. Dr. Dwyer thought that it would be a loss to the Section if aviation medicine was withdrawn from it. Possibly, the Civil Aviation Medical Service was involved in the proposal to some extent, but they were a comparatively small body; the Section should be aware of their problems and it would be better if they were coopted.

Dr. K. B. Fraser wondered what was behind the proposal to form a separate Section of Aviation Medicine, whether it was to be regarded as a separate section in future congresses or was to be merely a new section (a "special group") of the British Medical Association. Such a new section was undesirable and would have only two interests, civil and war flying, whose problems were common to them all, and any diminution of the interest of the Section (the Section of Naval, Military and Air Force Medicine and Surgery) should be rigidly opposed.

On the motion of Dr. J. M. Dwyer, seconded by Dr. K. B. Fraser, it was resolved that the Section viewed with concern the establishment of any additional section of congress or any group of the British Medical Association which would tend to diminish the communal interests of the medical services of the three forces. It was further resolved that the motion be referred to the Congress Committee for appropriate action.

The Medical Examination and Allocation of Recruits.

COLONEL A. M. MCINTOSH (Sydney) read a paper on the medical examination and allocation of recruits. He stated that the enormous increase in the variety and range of employment in the army consequent on the extension of mechanization and other technical developments had made necessary a more detailed and accurate classification of the functional capacity both of the recruit and of the serving soldier. Conditions required a high degree of physical capacity, varying with circumstances, an increasing level of intelligence, and temperamental stability. Precise selection of men was necessary on both physical and mental grounds. Not only must the individual characteristics of the man as a whole be correctly and completely assessed, but also the requirements of his intended occupation; that was the essence of the conservation of manpower. Colonel McIntosh then pointed out that the existing lettered system of classification stressed existing disabilities and resultant restriction in employment rather than giving an accurate indication of the man's functional capacity. Even then it did not set out restrictions in employment in enough detail to allow a decision on how the man could most profitably be employed in spite of his disabilities. Capabilities were of greater concern than disabilities. People should be employed at the level of their capability, physical, mental and emotional, in work commensurate with their interests, experience, knowledge and skill, with an opportunity to develop latent talent and ability. Dissatisfaction with existing schemes of classification had led to the development overseas of the Pulheems system, with some modifications in different countries. A similar scheme might possibly be introduced in Australia. For it to succeed, the general medical population must know its details thoroughly and be expert in its application; at first sight it seemed complicated and time-consuming, but those defects diminished with experience. Colonel McIntosh hoped that discussion following his paper would produce helpful suggestions relating to local application of the scheme. He then discussed in detail the Pulheems system and the modified form (Pulhes) adopted in the United States army. In this system the recruit was graded in each of a series of subdivisions or "qualities" and assessed on the result. The initial letters of the "qualities" (physical capacity, upper limbs, locomotion, hearing, eyesight, mental capacity, stability (emotional)) made up the word Pulheems; in the United States, physical capacity or stamina, upper extremities, lower extremities, hearing, eyes, and neuropsychiatric findings were the "qualities" considered. A provisional assessment at the time of a recruit's reporting for duty was followed by a service assessment after a period of basic training. To simplify the application of the system the Pulheems assessments acceptable to each corps or area were grouped and expressed in a two-letter code known as the Pulheems employment standard or P.E.S. Medical officers provided the Pulheems assessment or "profile", commanding officers allocated the P.E.S., the "G" staff laid down the classes of men acceptable within each theatre of war, and the "A" staff provided men of the required P.E.S. Thus the Pulheems system provided for a qualitative estimation of the individual. A qualitative analysis of employment requirements, expressed in the same terms, had also been worked out for all possible postings in the army. Colonel McIntosh stated, in conclusion, that in the making of an allocation the medical assessment was only one factor considered. The soldier's skill, training, experience and aptitude were all taken into account. However, strict observance of the Pulheems system would ensure that men were employed as far forward as was consistent with their capacity, but were not exposed to physical, mental or emotional strain that they could not endure.

DR. S. H. LOVELL (Sydney) said that Colonel McIntosh's paper had relation to one of the most difficult problems connected with war, the problem of completing a medical classification of recruits that would result in a maximum intake of suitable personnel with an optimum performance in the subsequent years of service and a minimum of ultimate repatriation liability through faulty medical examination on enlistment. The major difficulty in any scheme was the supply of medical examiners, and in particular, of medical examiners with clinical acumen and a good knowledge of active service conditions and requirements. That difficulty was accentuated by the fact that the demand for such examinations was a peak demand, since they had to be completed in a minimum of time. The system was interesting, and it was good to see the emphasis placed on the psychological factor, since everyone knew how important stability of temperament was under service conditions. Essentially, the system was one in which the emphasis was placed on function rather than on structure, and for that reason it commended itself. Colonel McIntosh had given a brief but clear account of its working. His paper should give those present something to think about seriously in the coming years, for obviously it would be necessary to make the utmost use of such manpower as was available.

DR. W. W. LEMPRIERE (Melbourne) thought the system was very well if men had time and ability to carry it out. At the beginning of war a flood of men came in, some of them men with criminal records, who might for a time be good soldiers until their records caught up with them. A second medical board in the training depot was necessary. A personal interview with the commanding officer was essential, and much depended on how a man was treated when he joined the unit. So often good material

was marred through bad handling. That was a factor of major importance. One of the greatest difficulties was to estimate the psychological factor, and he thought that there should be another classification, "NH" ("no-hoper").

DR. E. C. BLACK (Adelaide) had thought of applying the system in his classification of applicants for work in the South Australian Department of Railways, but found it difficult in the absence of a definite standard. He thought it might be of value in the classification of "New Australians".

SURGEON CAPTAIN D. A. PRITCHARD (Melbourne) said that no decision had yet been reached as to when the Pulheems system would be introduced in Australia. He thought it would be very difficult to have the standards closely observed. There were at present numerous United Kingdom ratings in the Royal Australian Navy who had been classified according to the Pulheems system, and it was found that in a number of cases the classificiations were incorrect.

DR. J. M. DWYER (Adelaide) thought it would be difficult to get "FE" troops unless standards were lowered. In the Australian army 15 men were required to keep one man in the front line, whereas Dr. Dwyer had read that the Russians required only six.

Section of Surgery.[1]

President: B. T. Edye, M.B., Ch.M., F.R.C.S., F.R.A.C.S., New South Wales.

Vice-Presidents: J. P. Ainsley, M.D., B.S., F.R.C.S., F.R.A.C.S., Western Australia; A. E. Coates, O.B.E., M.D., M.S., F.R.A.C.S., Victoria; A. O. Green, M.D., B.S., F.R.C.S., F.R.A.C.S., Tasmania; A. Lee, M.D., B.S., F.R.C.S., F.R.A.C.S., Queensland; P. S. Messent, M.B., M.S., F.R.A.C.S., South Australia.

Honorary Secretary: L. I. Burt, M.B., B.S., Queensland.

President's Address.

DR. B. T. EDYE (Sydney) read his presiden's address on the subject of carcinoma of the breast at a combined meeting with the Section of Radiology and Radiotherapy. The report of this meeting has already been published.

The Surgical Treatment of Gastric Ulcer.

DR. P. S. MESSENT (Adelaide), in the opening sentence of his paper on the surgical treatment of gastric ulcer, said that the aim of the surgeon was to assist in the care of his patient or to give him relief from his symptoms; his ambition should be to achieve that aim with the minimal sacrifice of healthy tissue and with the smallest possible disturbance of the physiological function of the organism. Dr. Messent asked whether the present-day attitude to the surgical treatment of gastric ulcer was correct, whether it was an attitude best calculated to prevent the occurrence of ulcer, or whether it was sometimes one of unjustified self-satisfaction in ability to remove unlimited segments of stomach tissue. The opportunity of avoiding mutilating operations for gastric ulcer rested primarily with the first practitioner consulted—unless a gastric ulcer was healed in the early stages, complete and permanent healing without a major surgical procedure was unlikely to occur. Though prevention was the ideal, the fact remained that surgical intervention was sought in many cases of chronic gastric ulcer. Dr. Messent went on to discuss what the extent of operation should be in such circumstances. It was not true that loss of tissue in radical operations caused no disability and that the patients were perfectly well. Those people on relief from pain might profess perfect health, but they did not enjoy it. Dr. Messent did not suggest that radical operation for gastric ulcer was never needed, but that such mutilations should be carried out with reluctance or even with shame because of ignorance which made such measures necessary. He described his preference for partial gastrectomy of the Pólya type for prepyloric ulcers or ulcers in the pyloric canal and for wedge resection for lesser curvature ulcers. If a jejunostomy was performed for penetrating ulcer high on the lesser curvature, the patient's condition improved, but in Dr. Messent's experience the large ulcers did not heal. In such cases the cardiac end of the stomach should be excised and for this an abdomino-thoracic approach should be used.

DR. V. J. KINSELLA (Sydney), in opening the discussion, stressed the fact that elective gastric surgery should be entrusted only to those specially trained. It was necessary to exercise great caution in performing conservative operations for prepyloric and pyloric ulcers because of the risk of carcinoma—a risk that it was not possible to assess. In the same way local excision of lesser curvature ulcers was not favoured, because there was always a risk of carcinoma and a risk of recurrence. Further, local excision did nothing to improve the condition of the stomach which had led to the development of the ulcer, while on the other hand it added a scar to the gastric mucosa and produced a deformity. It was not considered that there was any place for gastro-enterostomy in gastric ulcer, and any suggestion in favour of conservative operations for gastric ulcer was retrograde.

DR. A. E. COATES (Melbourne) reviewed his own experience of gastrectomy, favouring operations of an extensive nature. Recently the Steinberg procedure had been adopted and found satisfactory.

PROFESSOR N. SUTTON (Brisbane) said that since he had had unsatisfactory experiences with local resection of gastric ulcer, he now favoured gastrectomy in which the anastomosis was performed in accordance with the Laycock-Meister technique. Before operation much effort was expended to correct nutritional defects, particularly by the use of diets rich in protein.

DR. JOHN KENNEDY (Melbourne) favoured gastrectomy for gastric ulcer, but referred to the favourable results which occasionally followed simple gastro-enterotomy performed on patients who had a large fixed ulcer, the removal of which might have ended fatally. In some selected cases, a temporary jejunostomy was of great value in the immediate post-operative period.

DR. B. T. EDYE (Sydney) supported the thesis of the opening speaker that it was time for surgeons to look back and to ask whether they had been too drastic in the type of operation performed for gastric ulcer. The mortality rate following operation was proportionate to the severity and extent of the resection. Dr. Edye recalled experiences of post-operative disability, in support of the contention that not all gastrectomies were followed by happy results.

Dr. Messent, in reply, disagreed with Dr. Kinsella's contention that the rest of the stomach was diseased and that a local incision did nothing to improve its condition. Dr. Messent emphasized the fact that the object of his paper was to point out that unnecessarily large amounts

[1] The meetings held by the Section of Surgery with the Section of Radiology and Radiotherapy, with the Section of Anæsthesia and the Section of Pædiatrics, and with the Section of Medicine, have been recorded.

of tissue should not be removed, and further, that with the improvements in surgical techniques, anæsthesia and resuscitation, it was now possible to do such extraordinary things in surgery that surgeons should pause and make sure that the patient in the end stood to gain some benefit.

The Use of Antibiotics in Surgery.

DR. EDGAR F. THOMSON (Sydney) read a paper on antibiotics in surgery in which he drew attention to some of the newer antibiotics and emphasized the misuse of antibiotics in general. After some remarks on penicillin dosage he drew attention to a new preparation of penicillin—distaquaine G, a crystalline penicillin G procaine salt in aqueous solution. It was a sparingly soluble compound produced by the equimolecular reaction of procaine hydrochloride and a soluble salt of penicillin. The addition of an innocuous suspending agent permitted its ready and convenient suspension in water. It was easier to handle than oily solutions and was fairly stable. It should not be given intravenously. Dealing next with streptomycin, Dr. Thomson said that in tuberculosis it had made possible surgical procedures which would not previously have been attempted because of the danger of subsequent sinus formation. It might be given orally to reduce the bacterial flora of the bowel before extensive abdominal surgery. Dr. Thomson discussed "Chloromycetin" in some detail. It was, he explained, the first antibiotic to be produced synthetically on a practical basis. It was essentially non-toxic to man and it gave therapeutic levels in the blood and urine when given orally or rectally and therefore had not to be given parenterally. In surgical practice it had three main uses: (i) the preparation of the bowel for abdominal surgery; (ii) the treatment of certain surgical infections following operations on the bowel; (iii) the treatment of urinary infections due to Gram-negative bacteria. Aureomycin production was in Dr. Thomson's view probably the most important development in antibiotic therapy since the discovery of penicillin. It was the most versatile antibiotic yet discovered and its range of activity was wider than that of any other antibiotic. In surgical practice it would prove of great value in healing wound infections due to organisms which had become resistant to other antibiotics in the pre-operative preparations of the bowel; in the surgery of the eye; in the treatment of some urinary tract infections; and with penicillin in the pre-operative management of patients with organic heart lesions for the prevention of bacterial endocarditis. A special preparation of aureomycin for intravenous injection had been perfected, but was not yet available in Australia. Dr. Thomson next referred to bacitracin, an antibiotic obtained from a strain of *Bacillus subtilis* which produced a particularly active growth-antagonistic substance. It was a light tan powder, freely soluble in water and sterile isotonic sodium chloride solution. It had been found to inhibit the growth of many organisms, especially *Staphylococcus pyogenes*, the streptococcus and the pneumococcus. Its use at present was limited to topical application either by local infiltration of a saline solution directly into the base of pyogenic lesions or as a moist dressing, or by local application of an ointment to the eye or skin. Terramycin was a new antibiotic possessing potent antibacterial activity. Supplies had recently been made available to Dr. Thomson for clinical trial. In conclusion, Dr. Thomson referred to resistance to antibiotics. He said that antibiotics had supplied the surgeon with a powerful aid, but only an aid; they did not replace surgical procedures and they most certainly did not replace aseptic technique. They had to be used intelligently and with discrimination; this meant that there had to be adequate bacteriological control. That certain bacteria had developed resistance to antibiotics was largely the result of their widespread and indiscriminate use which had occurred in recent years. Dr. Thomson quoted reports from the literature to substantiate this statement. One of the most important factors was the use of antibiotics as prophylactics against infection. In surgery they might be used as prophylactics before certain procedures in the treatment of patients with organic heart lesions. Finally Dr. Thomson deplored the practice that had developed of the giving of antibiotics to patients who developed a rise in temperature in the post-operative period without any evidence that the fever was due to an infection.

DR. J. LYNCH (Brisbane) expressed agreement in general with Dr. Thomson, and endorsed Dr. Thomson's warning of the evil results that followed the indiscriminate use of antibiotics. As a result of his own personal experiences, he did not favour the injection of oily preparations of penicillin.

DR. V. M. COPPLESON (Sydney) referred to the benefits of the use of antibiotics in surgery at the present time, and questioned the wisdom of using such a thing as a "standard" dose of penicillin.

PROFESSOR N. SUTTON (Brisbane) referred to a new clinical entity—that of incompletely treated infection due to insufficient dosage in the early stages. Such errors led to many difficulties in subsequent stages of treatment.

DR. S. H. LOVELL (Sydney) explained that in the presentation of the paper Dr. Thomson had found it necessary to make some abbreviations, and that it was wrong to infer that all patients were treated at the Royal Prince Alfred Hospital on a routine "standard" dosage of penicillin. Initially much larger and varied doses were employed, and as the condition subsided the patient then went on to the "standard" dosage. The definition of a "standard" dosage within the hospital had been made only after serious consideration, and its employment facilitated the hospital administration. The work on antibiotic resistance presented by Dr. Thomson referred to the staphylococcus, and it was certainly important; but in surgery the staphylococcus was not the main problem—the streptococcus was the great killer of man and the cause of the worst infections, and fortunately showed little or no tendency to develop antibiotic resistance.

DR. K. C. T. RAWLE (Orange, New South Wales) referred to Dr. Thomson's belief that the organism should be identified before antibiotic treatment was commenced, and asked what should be done in country districts where no such facilities were available.

Dr. Thomson, in reply, said that the staphylococcus, *Bacillus coli communis* and *Bacillus pyocyaneus* all developed resistance to antibiotics, but fortunately that was not found to any extent with the streptococcus. In reply to Dr. Rawle, Dr. Thomson said that where no facilities existed for full bacteriological examinations and sensitivity tests, the practitioner could work only by trial and error.

Torsion of the Testis and its Appendages.

DR. S. H. LOVELL (Sydney), discussing torsion of the testis and its appendages, drew attention to a discrepancy in the incidence as disclosed by a comparison of figures published overseas with figures available in Sydney. The Sydney figures were very much lower than overseas figures, and Dr. Lovell wondered whether that observation was due to the fact that some of the Sydney patients were not treated as in-patients, only in-patient records being available. He also wondered whether the lesion was recognized when it was met. The generally hazy ideas on the subject, and in particular of the pathology, he thought might be due to faulty nomenclature; "torsion of the spermatic cord" was the term commonly used in textbooks and was misleading. Dr. Lovell said that the pathology fell under three headings: (i) torsion of a completely descended testis, which never occurred with a completely normal testis; (ii) torsion of an incompletely descended testis, which was commonly associated with inguinal hernia and imperfect development of the testis, epididymis and cord; (iii) torsion of an appendage of the testis *et cetera*, the appendage most commonly affected being the appendix of the testis. The pathology, clinical features, differential diagnosis and treatment were then discussed. Dr. Lovell suggested a simple method of management to minimize errors of diagnosis. Whenever the diagnosis was suspected, and when a diagnosis of

epididymo-orchitis was not unmistakably correct, under anæsthesia a transverse incision should be made over the scrotal tumour, the *tunica vaginalis* opened and the testis inspected. The procedure was simple and could be carried out under intravenous anæsthesia. If torsion had occurred, it would be obvious even to one who had never previously seen the lesion, and it could be easily dealt with. If, on the other hand, the case was one of epididymo-orchitis, the wound could be closed and no harm would result. Dr. Lovell urged that that procedure should be followed in any doubtful case; it was the only way to be sure, it was the only way to minimize the risk of atrophy of a testis which might have been saved, and it was easy.

DR. K. FRASER (Brisbane) opened the discussion by referring to the rarity of torsion of the testis in children aged up to twelve years. In a prolonged experience with cryptorchidism at the Brisbane General Hospital, the condition had rarely been seen. Dr. Fraser expressed general agreement with the ideas outlined in Dr. Lovell's paper.

DR. C. LEGGETT (Brisbane) described two cases which he had encountered of torsion of completely abdominal testes.

DR. H. D. STEPHENS (Melbourne) agreed that torsion of the spermatic cord was a misnomer; in the cases he had encountered the torsion had always been within the *tunica vaginalis*.

DR. E. S. STUCKEY (Sydney) believed that the torsion was always within the *tunica vaginalis*, and expressed the belief that it was not possible to release the twist.

DR. B. T. EDYE (Sydney) referred to two cases encountered some years previously, both of which had been associated with an acute pain in the scrotum in the night. Operation had not been performed and atrophy had followed.

Dr. Lovell, in reply, said that he considered it safe to attempt orchidopexy, because even if the testis did not survive it could be removed easily and no harm would come to the patient. In cases of strangulated hernia, surgeons commonly put the strangulated intestine back into the peritoneal cavity; therefore, why not put the testis back in the *tunica vaginalis* where it was much safer than in the peritoneal cavity?

Cutaneous Melanoma.

DR. D. YEATES (Brisbane) read a paper on cutaneous melanoma. He said that to avoid confusion, the benign pigmented mole would be referred to as a pigmented nævus and the malignant tumour as a melanoma. Melanoma could occur at any age; it occurred with about equal frequency in the two sexes and in over 50% of cases it developed in a preexisting pigmented nævus; when it did so, there was often a history of mechanical injury or of incomplete surgical removal. Melanomata were comparatively rare, and occurred most commonly on the lower extremity, the trunk, the head and the neck. Frequently a melanoma metastasized widely and rapidly; therefore early diagnosis and radical treatment were necessary. Dr. Yeates discussed the pathological features of pigmented nævi and of melanomata. He said that great experience was necessary in the microscopic diagnosis of early malignant changes in pigmented nævi. Features arousing suspicion were increase in size of the nuclei and cytoplasm of the nævus cells, cellular pleomorphism, mitotic figures, invasion of the overlying epidermis by groups of atypical cells, and unequal distribution of intracellular pigment in different parts of suspected areas. The behaviour of a melanoma was entirely unpredictable; a small, innocent looking pigmented tumour might prove rapidly fatal from widespread metastases, whereas occasionally a frankly malignant melanoma was cured by simple excision. The mode of spread of a particular melanoma was equally difficult to predict. Regional lymph node involvement was common, and often it had occurred before the glands were enlarged. Such early involvement of lymph nodes commonly occurred by lymph embolism; that fact had an important bearing on surgical treatment. Referring to treatment, Dr. Yeates said that in general pigmented nævi should not be removed; but they should be widely excised if they were so situated as to be constantly subjected to irritation. The specimen removed should be carefully examined by the microscope to detect any sign of malignant change. If a malignant melanoma was present, the primary tumour should be widely and deeply excised, and if possible the regional lymph nodes should be excised *en bloc* about two weeks later. In the extremities amputation of digits or even the whole limb might be necessary. Involvement of lymph nodes should bring about consideration of block dissection of a more proximal group. X-ray therapy was of little curative value, but might be of use for palliation. Dr. Yeates gave a short account of a small series of cases in his own practice.

PROFESSOR N. SUTTON (Brisbane), in opening the discussion, referred to the differences of opinion which still existed in respect of certain aspects of the management of cutaneous melanoma. He said that the great majority of patients suffering from that condition examined at the Brisbane General Hospital were received from the Queensland Radium Clinic, to which they had been referred by general practitioners; that fact indicated that a large body of the latter still considered that radiotherapy had some value, although such a view was contrary to modern opinion. Since Masson's concept of the origin of cutaneous melanoma had been discarded and its epithelial origin accepted, the lesions should be dealt with as was the custom in the treatment of other epithelial malignant neoplasms —by excision of the primary growth and of the regional lymph nodes. Although melanomata were notoriously unpredictable in their behaviour and prognosis, the greatest number metastasized in regular manner via the regional lymph nodes, and for that reason it appeared proper to remove those nodes. Patients who developed blood-stream metastases were probably beyond any treatment. The rarity of deposits along the lymphatic channels themselves did not justify the excision of intermediate strips of tissue between the growth and the regional nodes. Although in recent times some people had advocated biopsy for diagnostic purposes, it was considered to be dangerous and inadvisable.

DR. P. S. MESSENT (Adelaide) referred to the disastrous results which had followed incorrect treatment such as cauterization. The difficulty of deciding whether to remove the regional glands or not was associated with the fact that the pathologist was not always able to tell if the melanoma was malignant, and that led to a hesitant approach to that aspect of management.

DR. V. M. COPPLESON (Sydney) quoted the statement that cutaneous melanomata did not metastasize until after puberty, and that as a corollary such lesions should always be excised before that time if possible. Dr. Coppleson asked Dr. Yeates whether his series included any such cases.

DR. J. P. AINSLIE (Perth) called attention to the need for education of general practitioners in regard to the importance of cutaneous melanoma. He said that a great deal of anxiety arose in any given case because of the difficulty in estimating the future behaviour of the lesion from its histological appearances. Dr. Ainslie questioned the wisdom of and justification for amputation of a limb because of well-established melanoma.

Dr. Yeates, in reply, said that he recognized the difficulty the pathologist experienced in determining the degree of malignancy of the primary growth. In reply to Dr. Coppleson, Dr. Yeates said that he had received a personal communication from Dr. K. B. Fraser, who had never encountered a malignant melanomata in a child at the Brisbane Children's Hospital, and for that reason agreed with the belief that such growths probably did not metastasize before puberty and recommended their removal before that time whenever possible.

Shark Attacks in Australian Waters Since 1919.

DR. V. M. COPPLESON (Sydney) presented a review of shark attacks in Australian waters since 1919. He referred to 77 attacks on bathers and swimmers, of which 46 had

occurred in New South Wales, 22 in Queensland, four in Western Australia, two in South Australia and two in Victoria; one attack had occurred at Flinders Island in Bass Strait. Dr. Coppleson discussed the types of injury inflicted and the types of shark involved, as far as they were known, and set out some of the information given by the data. He said that apart from attacks along the Barrier Reef, the majority of attacks occurred in harbours and estuaries and on beaches near their entrances. The dangerous period was approximately from November to April. It seemed that sharks, which were cold-blooded creatures, were active, at least along the east coast, only when the sea temperature was 70° F. or more. A striking feature was the occurrence of many attacks in groups. In all the Australian attacks, except one, any available evidence pointed to the fact that only one shark was concerned in the attack. There was little support for the view that the sea was full of man-eating sharks hunting in packs, ready to pounce on unwary bathers. The evidence suggested the presence of only one shark in the vicinity of much-frequented bathing beaches. The shark was a vicious one which patrolled a certain area of coast, river or harbour. If he left it for a time, he returned to the same patrol area, and might do so for a number of years. The extent of his territory appeared to be about 12 miles. Once an attack had taken place, further attacks might be expected within ten miles and even up to one or two years later unless the shark was destroyed. Dr. Coppleson said that in Australian waters there was an ever-present danger of shark attack on beaches, in harbours, in creeks, in rivers and in estuaries, especially along the eastern coast north of Port Hacking and probably along the northern and north-western coasts. The danger to any individual bather was infinitesimal; but the injury was particularly horrible and dangerous. Precautions were necessary for safety. Bathing in enclosed areas was best. Meshing, which had been introduced by the New South Wales State Government, appeared to have greatly reduced the risk of attack. Local bodies should take action when a shark was known to be in the vicinity; it should be their business to detect such sharks, and they should be able to call upon other authorities to assist in their destruction. Vigilance both before and after attack in open beaches, in harbours or in inland waters should never be relaxed in the presence of a dangerous shark; it should be hunted until it was destroyed. There was reason to believe that a number of shark fatalities would not have occurred if the facts set out had been known and proper precautions had been taken.

DR. H. FLECKER (Cairns), in opening the discussion, referred to the digestive functions of the shark; he quoted Vonte's opinion that they were satisfactory and that both hydrochloric acid and enzymes were present. If digestive changes had not be noted on a swallowed limb, then some other cause must be found. In some types of fish putrefaction accounted for the apparent digestive changes. All the several rows of teeth were used in attacking a victim, and that explained why sharks could bite right through a limb or even the body in one snap. Some of the scarring of native divers commonly ascribed to sharks might well be due to bites from the North Queensland groper, which had only a single row of teeth. However succesful meshing had proved in Sydney waters, the expense involved might preclude its use in less populated areas; but there was room for the extension of such safety measures as air patrols, life-saving patrols and the use of chemical repellents. Dr. Flecker suggested that a registry of shark attacks should be set up, on the same basis as that for snake bites formerly maintained by the Police Department and analysed by the late Dr. F. Tidswell, and as that at Cairns for injuries due to poisonous plants. Dr. Flecker said that while Dr. Coppleson's thesis that shark attacks always occurred in series was attractive, the factor of chance could not be excluded on the figures available.

DR. H. MAITLAND (Bathurst) expressed the opinion that some digestion undoubtedly occurred. He based his opinion on experience gained in Indian waters, where attacks were numerous.

DR. VAL MCDOWALL (Brisbane), from observations made while fishing, said that some digestive changes occurred very quickly. On one occasion dissection of a shark had revealed a gastric ulcer.

DR. A. O. GREEN (Hobart) suggested that the shark responsible for an attack might be suffering from a disability which precluded it from getting its normal fish food. He asked for information about the acuity of a shark's sense of smell.

Dr. Coppleson, in reply, said that the question of digestion in sharks was hard to discuss, but evidence from authenticated cases suggested that it was particularly slow. Work had been done in Genoa on that and allied subjects, and the results had shown that the stomach of the shark contained very little hydrochloric acid. Dr. Coppleson said that he himself had kept a reasonably accurate registry of all such attacks since 1919. It was believed that blood might attract sharks, and that the sense of smell was very acute. It was as yet too early to comment on the value of chemical repellents.

Millin's Retropubic Prostatectomy.

DR. J. B. SOMERSET (Melbourne), in a paper read in his absence, discussed Millin's retropubic prostatectomy. He said that the operation, when successful, had certain obvious advantages—the short period in bed and short stay in hospital, and the elimination of suprapubic urinary drainage. It also had certain drawbacks. It had been devised in an attempt to produce a reasonably safe operation with easy convalescence, permanent relief and a quick return to normal activities. The pre-operative treatment was the same as for any other form of prostatectomy, except that the making of a cystoscopic examination either during the pre-operative period or as a first step on the operating table was essential. Dr. Somerset then described in detail the special instruments necessary and the technique of the operation, and mentioned the difficulties encountered during its performance. Referring to post-operative complications, he mentioned first hæmorrhage. He said that he had had no trouble with reactionary hæmorrhage into the bladder, but on one occasion reactionary hæmorrhage into the prevesical space had necessitated reopening of the wound. No case of significant secondary hæmorrhage had occurred, although on three occasions the urine had become brightly blood-stained during the usual danger period and more prolonged catheter drainage had been necessary. In two cases obstruction had developed within a few weeks after the operation; in one of these an unsuspected carcinoma of the prostate was present, but in the other the cause was a severe fibrous stricture extending along the whole length of the prostatic cavity. Dr. Somerset commented adversely on the practice of enucleating the prostate and leaving the prostatic part of the urethra intact; he believed it to be unsound, because the blood supply of the prostatic part of the urethra must inevitably be destroyed. In his series the complication of either partial or complete incontinence of urine had not occurred. With regard to suprapubic fistula, he said that in several cases some urinary drainage occurred from the wound after removal of the catheter, but lasted for only a few days; all the wounds healed firmly. One instance of *osteitis pubis* had occurred. Dr. Somerset said that *osteitis pubis* had been considered more common after retropubic prostatectomy than after any other form; if the statement was true, he would regard it as a major drawback to the technique. Œdema and bruising of the penis had occurred in one case, but the condition was transient, and in the series no case of epididymitis had occurred. The average post-operative period in hospital had been fifteen days, if the case of *osteitis pubis* was excluded. However, it had to be remembered that the cases had been selected, the patients being good operative "risks", and in all except three the prostate was easy to enucleate. The average duration of the operation was forty to forty-five minutes. There was very little post-operative shock—much less than that encountered during the suprapubic enucleation of the prostate.

DR. M. GRAHAM SUTTON said that Dr. Somerset had been frank in recording his difficulties, and helpful in sug-

gesting improvements in the technique of Millin's operation. With many of those Dr. Sutton was in complete accord. He felt that the extravesical retropubic approach did "enable the surgeon to deal with all pathological conditions met with in the prostate, and its urethra", whether adenomatous, calculous, fibrotic or neoplastic. Moreover, it afforded an opportunity for him to alter his subsequent procedure to meet the exigencies of the pathological condition found, and to act in the best interests of his patient, as Dr. Somerset had found necessary at times. The other advantages, to Dr. Sutton's mind, were that it allowed a direct view of the prostatic bed, so that seed adenomata and tags could be removed and hæmorrhage controlled. Thus less post-operative bleeding and a smoother convalescence were favoured; convalescence was free from bladder tenesmus, since the bladder was not incised or sutured. The work in hand was nearest to the operator, and not in depths of the wound as in the perineal operation, nor at the bottom of a deep cavity as in the transvesical. There was, therefore, no need for that barbarous implement—the boomerang needle—as Dr. Somerset had pointed out. Designed for suture in inaccessible positions, it was quite unsuitable for the open operation, and the need for its use in the other two approaches spoke volumes for the indirectness of these methods. Dr. Sutton had never used any other than a long needle-holder and a fully curved needle for Millin's operation. He also agreed that the vertical abdominal incision was quite satisfactory; it allowed more room for the ulnar border of the hand and manipulation of instruments, and was more suitable if total prostatectomy became necessary, owing to the discovery of occult carcinoma.

The preparation for the incision of the capsule was the most hazardous and difficult step in the retropubic method. If it was hurried or roughly done, copious and at times dangerous bleeding might occur, either from the superficial branch of the deep dorsal vein of the penis, or from the veins in the prostatic sheath. The superficial veins had to be dealt with as described by Dr. Somerset, but Dr. Sutton was at variance with him concerning the others. He much preferred to ligate the central vein low down, leaving the ends long for subsequent suture, then to ligate the proximal end of it at the bladder neck, and to make an almost vertical incision through the capsule, as advocated by Mr. E. W. Riches. But, before this incision was made, a most important and helpful procedure introduced by Millin was to inject subcapsularly 20 millilitres of 1% procaine solution containing 0·5 millilitre of pitressin. This lessened the bleeding and raised the blood pressure 10 to 15 millimetres of mercury, a rise that was just about cancelled out at the end of the enucleation. The vertical incision avoided cutting or bruising of the larger lateral veins, and mitigated, Dr. Sutton suggested, the likelihood of *osteitis pubis*. After the enucleation, he inserted a spreader in the capsule. This afforded an excellent view of the cavity and avoided many difficulties, but Dr. Sutton said that he would try the lateral traction sutures. In dealing with the bladder outlet, he preferred a Harris type stitch if a middle lobe had been present; if not, a wedge resection was advisable. He noted with interest Dr. Somerset's reference to the "pedicles". They were certainly worthy of respect and adequate disposal. That was where malignant invasion from the so-called posterior lobe usually occurred. Closure of the vertical capsular incision was much easier than the transverse, and Dr. Sutton agreed that it should be tested, since that helped to prevent suprapubic leakage with wound infection.

In regard to complications, Dr. Sutton said that in a consecutive series of 75 patients on whom Millin's operations was performed, two had died. One, aged eighty-one years, had died from post-operative pneumonia and cardiac decompensation on the seventeenth day; the other, aged sixty-two years, from hæmorrhage and shock followed by ileus on the third day. Otherwise his experiences had been much like Dr. Somerset's. There had been three cases of secondary hæmorrhage, one requiring reopening and packing; one case of post-prostatectomy obstruction—the first, in a Chinese patient; two cases of penile stricture, due no doubt to pre-operative or post-operative urethritis; no cases of persistent fistula or of incontinence had occurred. *Osteitis pubis* had occurred in three cases; one subject was ill-chosen and the operation should have been done in two stages, and all three had occurred before he started to use the vertical capsular incision.

Attempts at conservation of the prostatic urethra had not been encouraging. The early perinealists, Proust and Albarràn, and Young, had tried it, as did Morson with his transvesical prostatic "speculum" demonstrated in Melbourne in 1935. In the same year, Jacobs and Casper, and Millin in 1944, had essayed it retropubically. All had abandoned the idea. However, many competent surgeons were advocating subtotal prostatectomy for benign obstruction. If warranted, this would mean direct union of the bladder neck mucosa to that of the urethra, as outlined by Souttar, so that the prostatic cavity would have an immediate mucous lining. It would also mean the exclusion of post-operative pyuria and epididymitis from prostatovesicular sources of infection and the prevention of post-prostatectomy obstruction, both benign and malignant. For the present, however, Dr. Sutton believed Millin's operation to be a very satisfactory procedure, but said that transurethral resection was adequate for fibrous and hypertrophic median bar, with or without small lateral lobes situated posteriorly. In cases in which a dilated bladder and gross infection were present, a two-stage operation was necessary; and when fibrosis had obliterated the space of Retzius, a transvesical or other approach should be made. Finally, because Millin's operation conformed to Otto Maier's postulates (1924), and did not preclude the use of Harris's stitches, if so desired, Dr. Sutton believed it had come to stay. Otto Maier's postulates were: (i) approach by the shortest route; (ii) avoidance of damage to the bladder; (iii) avoidance of damage to neighbouring structures; (iv) rapid return to normal micturition; (v) avoidance of fistulæ. There might be added early ambulation and avoidance of pre-operative or post-operative infection. The operation required only simple suitable instruments, and as Dr. Somerset had said, a good light and a strong sucker.

DR. T. GIBLIN (Hobart) said that he used Millin's operation as a routine method for prostatectomy, with occasional exceptions in special circumstances. No special instruments were really required. Persistence of suprapubic drainage for three weeks or more had been the main post-operative difficulty. Dr. Somerset's idea of a special hole in the catheter to drain the prostatic cavity appeared to be sound.

DR. A. E. COATES (Melbourne) said that his experience with Millin's operation had been satisfactory.

Complications following Some Urological Surgical Procedures.

DR. F. W. LUKIN (Brisbane) explained that his paper on complications following some urological surgical procedures was intended for those who undertook urological procedures as part of a wider sphere of activity. He started with the urethra and drew attention to the fact that, with resistance of the sphincter and a break in the mucous membrane, it was easy to inject material into the highly venous tissue of the *corpus cavernosus*. The term catheter fever implied the absorptive capacity of the mucous membrane. Among other infections of the lower urinary tract were unilateral or bilateral epididymo-orchitis and purulent urethritis which were liable to follow repeated catheterization and were particularly prone to occur with an indwelling catheter. The prostate itself might take part in infection and such a reaction might follow an acute or a chronic course. In acute cases the swelling and œdema might be followed by acute retention of urine. The moral was that an instrument should never be passed on a urethra which was being taken on a train journey soon afterwards. Abscess formation of the prostate, while fortunately uncommon, did follow heavy instrumentation. A complication, happily becoming rarer, was rupture of the urethra. It was possibly correct that no urethra would be damaged if sounds were passed without any anæsthetic. The bladder was not likely to be infected

by organisms introduced on an instrument if there was no bar to its complete emptying. This was not the case if the bladder and particularly the trigone were damaged on the site of pathological change. When acute retention of urine could not be relieved transurethrally the suprapubic route had to be resorted to, but puncture of the bladder by trocar and cannula should be avoided if possible. A fine needle (of the lumbar puncture type) might be used in certain circumstances. All things considered, suprapubic cystostomy was the best procedure. Dr. Lukin referred to hæmorrhage, spasm and shock which might occur after cystostomy and pointed out that with patients who were very ill it became a major undertaking. In conclusion, Dr. Lukin discussed briefly some of the complications that might follow prostatic enucleation. He mentioned anuria, delayed hæmorrhage and the persistence of a suprapubic sinus, and also the ready detection by rectal examination of malignant change in the prostatic capsule.

DR. A. INGLIS (Brisbane) agreed with Dr. Lukin's objection to the use of local anæsthetic agents in the urethra. He considered that method to be unsatisfactory, and in its place he used low spinal anæsthesia or "Pentothal". Dr. Inglis said that the use of unnecessarily large instruments was a common cause of avoidable urethral trauma, which might result in worse troubles than those which were being investigated. Dr. Inglis did not agree with Dr. Lukin's statement that fewer urethræ would be damaged if all investigations were carried out under general anæsthesia. Sandalwood oil, three minims in capsules three times a day, had been found most useful for vesical spasm—a not infrequent sequela of urethral investigations.

DR. P. ROW (Brisbane) described methods of retaining indwelling catheters, and favoured the use of a clove hitch stitch.

DR. L. BALL (Melbourne) said that he always used local anæsthesia and had found it satisfactory. A 6% solution of "Novocain" was used. As experience with the various types of bags had not been satisfactory, "Oxycel" was not employed in the prostatic cavity after resection.

DR. T. GIBLIN (Hobart) said that he favoured the use of chemotherapy in a prophylactic role whenever "catheter fever" could be expected from previous experience. Otherwise it was preferable to withhold such treatment until the organism had been identified. In a difficult case of proteus infection cure was effected by the combined use of aureomycin and streptomycin.

SIR VICTOR HURLEY (Melbourne) said that his experience with local anæsthesia had been satisfactory, provided that the patient was kept in the supine position. He favoured a 6% solution of "Novocain". After it had been instilled with a glass syringe, some sterile liquid paraffin was injected into the urethra. The discussion on the relative merits of rigid and flexible instruments was valueless; the best instrument to use was the one that one could use best. Meatal stricture was one complication to which no one had made reference. It was not uncommon, and its incidence could be reduced if catheters were not left in position for too long a period.

Section of Orthopaedics and Physical Medicine.

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Honorary Secretary: T. V. Stubbs Brown, M.B., B.S., F.R.C.S., Queensland.

President's Address.

DR. LENNOX TEECE (Sydney) took as the title of his presidential address "The Stiff Shoulder". He said that the chief causes of the condition were capsulitis or periarthritis, degenerative changes in the supraspinatus tendon, usually with calcification (sometimes painless), partial or complete rupture of the supraspinatus, and fractures in the neighbourhood of the joint. In periarthritis or capsulitis, the pathological changes found were thickening of the capsule with adhesion to the head of the humerus, and adhesion of the supraspinatus and infraspinatus tendons to the underlying capsule. The condition was inflammatory and the patients were generally aged between forty and fifty years. It was much commoner in women than in men. The onset was usually sudden with severe pain, and the clinical course was remarkably constant. In the acute stage treatment was by rest, sedation and possibly the application of heat. When the acute stage had passed and pain was present only in forced movement, manipulation under anæsthesia was required. If vigorous treatment was not given at the proper time after the acute stage had passed, limitation of movement would result. Dr. Teece described the details of the manipulation, and pointed out the need for care in its application. He said that the condition never called for excision of the acromion process. With regard to degenerative changes in the supraspinatus tendon, Dr. Teece said that there might be a history of trauma, often indefinite. The condition was most common after the age of forty-five years. A number of patients failed to respond to conservative treatment, and for them acromionectomy was indicated. The one indication for that operation was the presence of a painful phase of movement that had resisted conservative treatment. If true organic stiffness was present in the joint, the operation was not indicated. No attempt should be made to remove calcified deposits from the tendon. Degeneration of the supraspinatus with calcification had to be distinguished from acute calcification in an otherwise normal shoulder, which occurred at an earlier age, and which was not associated with organic limitation of movement, as would be revealed by examination of the patient under anæsthesia. Referring to partial or complete rupture of the supraspinatus tendon, Dr. Teece said that such ruptures were almost always the result of violent muscle effort. Complete tears should be sutured after removal of the acromion process; but the result was not certain, as normal tendons rarely ruptured. The ruptured tendon was usually degenerated and inelastic, so that the mechanical difficulties of suture were insurmountable. Relatively minor ruptures were efficiently treated by rest for six weeks on an aeroplane splint. Dr. Teece went on to say that fractures in the neighbourhood of the shoulder joint were a prolific source of stiffness, which was often the result of inadequate or inefficient treatment. In no other region had anatomical replacement less relationship to functional results. Correct manipulative reduction should be performed when possible, unless contraindicated. Open reduction was rarely called for and might be dangerous. The functional result might be enhanced, in the adult, by early movement; active movement should begin from five to fifteen days after the injury. The commonest fracture in adults was an abduction fracture of the neck of the humerus, commonly with impaction and angular convexity medially. If impaction was present, it should not be interfered with; an aeroplane

or abduction splint should be used. Unimpacted fractures should be treated with the arm kept at the side. Dr. Teece condemned the devices suggested to maintain continuous traction. He said that bad results occurred in cases in which prolonged immobilization had been practised, and bore no constant relationship to the degree of deformity. However high the degree of displacement, with early movement gross restriction of movement rarely persisted. Restoration of movement was always perfect in children, though operation might be required later for cosmetic reasons.

DR. THOMAS KING (Melbourne) said that he thought that the shoulder malady known as "capsulitis", "frozen shoulder" *et cetera* was acute arthritis, either traumatic or infective, and that it sometimes followed operations on the gall-bladder. He advocated carrying the arm in a sling, the exhibition of sedatives, and the avoidance as far as possible of manipulations, which appeared in most cases to be unnecessary treatment, and said that the treatment he had outlined might take longer, but was usually successful. He thought that the condition loosely described as "fibrositis" was a rarity.

DR. T. U. LEY (Townsville, Queensland) advised injection of the sympathetic cervical ganglion.

DR. J. R. S. LAHZ (Brisbane) said that he used abduction splints "over the clothes" for patients with stiff and painful conditions of the shoulder. Manipulations were of no use unless the patient could repeat the procedure later. Dr. Lahz admitted that some of the calcium deposits in the shoulder were "sandy", but said that in other cases, after the insertion of a needle, the material squirted out along the track.

DR. C. MORGAN (Sydney) reported that at Guy's Hospital he had seen patients with stiff shoulders treated by injection of the stellate ganglion, with improvement.

DR. MICHAEL KELLY (Melbourne) advised injection of painful areas. He said that he had used the method in many cases, and intended to use it in the future.

DR. A. V. MEEHAN (Brisbane) said that in acute arthritis movement in all directions was limited; but naturally in the shoulder region the insertion of the muscles into the capsule was such that inflammation of any of them amounted to involvement of the joint. It was necessary to distinguish between the acute inflammation following trauma and that following infection. The former should be dealt with by early movement. Manipulation should not be carried out in the acute phase of either condition; many patients were cured without manipulation; manipulation should be gentle. Dr. Meehan described one case in which *myositis ossificans* developed after a severe manipulation.

Dr. Teece, in reply, said that manipulation was often used in the treatment of shoulder stiffness; but the main consideration was the time at which it should be carried out.

Painful Feet in the Aged.

DR. MERVYN ROBINSON (Ballarat, Victoria) discussed the treatment of painful feet in elderly patients, in the light of experience obtained in an institution and hospital at Ballarat. He said that all who entered the home were examined on their admission, to see whether operation would benefit them. The selection of patients for surgical treatment was based on the patients' wishes, on the amount of pain and on the patient's general condition; clinical observations were usually sufficient to allow a decision to be made. Restoration of mobility to bed-ridden patients was attempted. Dr. Robinson then discussed in more detail the following conditions: (i) *hallux valgus* (with a brief description of the operative technique and after-treatment); (ii) advanced arthritic conditions of the feet; (iii) minor conditions such as onychrogryphosis, hammer-toe, ingrowing nails, plantar callus and painful heels; (iv) pain in the feet due to arterial spasm and diabetic neuritis (conservative and radical treatment being considered). Among the rarer conditions causing painful feet were epithelioma, synovial tuberculosis, chronic osteomyelitis and frostbite. Dr. Robinson said that the opportunity was taken, during examination of large numbers of old people, to check the feet in all cases of Dupuytren's contracture of the hands. A similar condition was noted in many such cases—a much larger proportion than was usually thought. The observations of many workers were thus confirmed. As the thickening was not crippling or painful or readily palpable, no treatment was necessary in any case. In conclusion, Dr. Robinson said that, although many of his observations referred to seemingly minor complaints, much could be done to relieve the aged. Alleviation of pain and restoration of mobility were of value from the humanitarian and economic aspects.

Arthroplasty of the Hip Joint: The Smith-Petersen Operation.

DR. JOHN HOETS (Sydney) discussed Smith-Petersen "mould" arthroplasty in the treatment of osteoarthritis of the hip joint. He said that severe pain and stiffness of both hips were the outstanding indications; one stiff hip, if painless, caused little inconvenience. Active infection such as tuberculosis was a contraindication. Subacute and chronic low-grade infections generally constituted contraindications. To operate in the presence of a raised blood sedimentation rate was to court almost certain failure. Dr. Hoets then set out various points in which the original Smith-Petersen operation had been modified, or which had not been completely appreciated. He said that the original approach had been extended; the muscles were stripped not only from the lateral aspect of the ilium, but also from the medial aspect, so that the acetabulum was exposed more completely. The osteotomy of the acetabulum included portion of the anterior inferior spine of the ilium, so that dislocation of the femoral head was easier. In the shaping of the acetabulum and the femoral head, it was important to select a mould which fitted loosely in the new acetabulum, and in which the newly shaped femoral head moved loosely. It was important before closing the wound to try the function of the joint for range of motion and stability, so that the optimal post-operative position might be determined, and the post-operative exercises might be guided. After operation fresh osteophytes might form on the trimmed surfaces; Smith-Petersen advised the treatment of the cut surfaces with diathermy to prevent the formation of osteophytes. Blood loss might be severe, so a blood transfusion was commenced with the operation and given as a routine measure. Dr. Hoets said that he himself found it satisfactory to use a small drainage tube for twenty-four hours, to avoid the risk of hæmatoma formation. A penicillin "cover" was used for several days. Dr. Hoets went on to discuss after-care. He said that the patient was returned to a firm bed with a Balkan frame attached, and the limb was placed in a comfortable position with suitable measures to prevent external rotation, which carried with it the danger of dislocation. Dr. Hoets described the splinting and nursing measures which were necessary to keep the patient comfortable and to keep the limb in the optimal position. During the first fortnight the patient was recovering from the operation; during the second fortnight the real work of rehabilitating the hip was begun by the physiotherapist. From then on the active cooperation of the patient was essential, and in the later stages he would have to be prepared to endure some pain, and to make a constant and serious effort over many months if he was to gain the maximal benefit from the operation. When the patient was ready to walk with crutches, they should be selected carefully for correct length and weight, and the patient should be taught to use them properly. He would require them for at least six months from operation, and often for as long as twelve months. The new joint was fully occupied in recovering movement, and the gradually increasing range could be obtained only by hard work and strain on the newly formed scar tissue, which was accompanied by pain. The tissues had plenty to do without weight-bearing. The

optimal condition for movement and weight-bearing was not reached for two or three years. Exercises on the fixed bicycle and swimming were valuable in that connexion. Dr. Hoets finally said that Smith-Petersen mould arthroplasty offered a real advance in hip surgery for certain conditions, and that in properly selected cases it brought relief from constant and crippling pain and stiffness as no other measure could. He paid a tribute to the contribution made by Smith-Petersen to hip surgery.

Dr. Hoets also showed a coloured cinematographic film of the operation and its result; the special Smith-Petersen instruments were illustrated in the film.

DR. J. R. S. LAHZ (Brisbane) said that the capsule was almost non-existent in the cases under discussion, and asked what happened after operation, and how the cup was kept in the deepened acetabulum.

DR. THOMAS KING (Melbourne) thought that a subtrochanteric osteotomy should be performed before one embarked upon the arthroplasty, but admitted that Smith-Petersen had stated that such a procedure made a later arthroplasty difficult. The tendency to dislocation of the cup by external rotation was partly controlled by wide abduction for four to six weeks.

DR. J. KENNEDY (Melbourne) said that he had seen the operation performed by Smith-Petersen in 1938; it had taken four hours, but was carried out with meticulous detail.

DR. L. TEECE (Sydney) said that intraarticular operations on the hip were deep, dark, dangerous and bloody. Penicillin cover was a menace, as more and more organisms were waxing strong in hospitals.

Operative Infection.

DR. J. R. S. LAHZ (Brisbane) read a paper on operative wound infection. He said that, although wound infection had a low incidence, it still occurred more often than it should, and insufficient inquiry was made into the reasons for its occurrence in each case. Operative infection included wound œdema, wound flush and early postoperative rise of temperature; that fact was not always recognized. Suppuration was most frequent in wounds entailing, for example, one or more of the following: long or extensive exposures, great trauma, inadequate hæmostasis, the use of drainage material, and possibly foreign body implantations (plates, wires, bones *et cetera*). Especially was that so if the patient was debilitated and his tissues had little resistance, and if precise knowledge of how to perform the operation was lacking. Moreover, even in the best organized staff many slips in aseptic technique were made. Dr. Lahz then set out a number of faults that commonly occurred. He referred to the absence of thermometers from some autoclaves, and to the unreliability of autoclaving at so many pounds' pressure if the temperature did not rise to 250° F. at the lowest part of the autoclave atmosphere. The boiling of instruments in pure water was not enough to sterilize them unless an electrolyte was added; if clostridia and other spores were to be eliminated, autoclaving must be insisted upon. Bare blankets should never appear in operating theatres; certainly never ward blankets. Theatre blankets should be oiled and enclosed in linen blanket slips. Patients should be clothed in non-woollen fabrics and in cotton or lisle socks. The arms of surgeons should be scrubbed to above the elbows, and the scrubbed upper limbs should be held upwards so that water from the upper parts of them could not run onto the hands. A complete change of clothing before entering the operating theatre was essential, and operating covers should be worn on footwear. Dr. Lahz went on to describe in detail a number of precautions which he considered should be observed with regard to the patient, the surgeon and the attendant staff. He reminded those present that all operative wounds were contaminated with bacteria, as Lister had believed. In the second phase of surgery, introduced by Lister, the surgeon was content with the sterilization of gear, staff and patient; the third phase, described by Mauricio Gudin, would provide sterile air and a completely sterile operating theatre, the human contents of which were scrupulous in not infecting the atmosphere with their respiratory organisms. It had to be admitted that first-intention healing, as it existed, was healing in the presence of heavy contamination with bacteria, which was the basic error in the present system. Surgery would have to discover a universally effective antibiotic, or achieve Gudin's integral asepsis. Attention would have to be paid to the patient's skin, to root out such invaders as the *Staphylococcus albus*, which was not always innocent. The surgeon's face and eyebrows should be well washed. The common sources of air contamination were wool, linen *et cetera*, the operating theatre walls, the air ventilating the theatre, the furniture, and the respired air of those who sneezed, coughed or talked. Dr. Lahz described a series of simple experiments that he periodically carried out in operating theatres to show how the bacterial count increased with movements of equipment or personnel, and particularly so with talking, coughing and sneezing. The calmer and purer the operating theatre, apparently, the purer would be the air. Dr. Lahz referred to experiments with masks that had been carried out by the Medical Research Council of the Privy Council. Various types of mask were tested; the best was a simple, well-fitting, closely applied gauze mask, which filtered the main stream of air but did not deflect it. But the important point was that with quiet breathing only, even when no mask was worn, the air bacterial count dropped almost to negligible proportions. Silence was an efficient mask; silence and gauze (80 threads per inch) were nearly perfect. No patient should be anæsthetized in the operating theatre, and anæsthetists could help to maintain atmospheric purity by maintaining calm anæsthesia until the patient had left the operating theatre, so that vomiting occurred only outside. Air contamination of wounds might be largely removed by filtration of the air, by electrostatic precipitation of dust or by ultra-violet irradiation with 2500 to 3000 Ångström units. In recent years work had been done on chemical methods of disinfecting the air in rooms. The results were promising, and the time might be near when an atmosphere congenial to humans and lethal to bacteria would be attainable. Dr. Lahz said that he himself had for some time past washed out every operation wound, since nearly all contaminating bacteria were known to lie superficially. The acridine and quaternary ammonium compounds were harmless antiseptics that could be used in effective strengths. He thought that the infection rate had been reduced by that procedure. Dr. Lahz finally outlined some suggestions for better hospital design, equipment and procedure, so that the third phase of surgery might come into being.

Internal Fixation for Recent Fractures of the Shafts of Long Bones.

DR. THOMAS KING (Melbourne) read a paper on internal fixation in the treatment of recent fractures of the shafts of long bones; he said that the method at the present time was perhaps too commonly practised. For example, some surgeons who were advocates of "no-touch" technique were foremost in advising plating or using Küntscher nails in the treatment of compound fractures, and even of doing so after skin grafts had been used to close the defect caused by loss of skin. Those with special skill might use those methods with success—and sometimes with failure; but that course of treatment was hardly suitable as a routine method of treating compound fractures, especially if multiple injuries were present—for example, a fractured skull, tibia and fibula as well as a fractured femur *et cetera*—and if the time was 2 a.m. and the patient shocked and perhaps debilitated or alcoholic. Some orthopædic surgeons could remember, in the days before antibiotic drugs, the grossly infected wounds that were illustrated so beautifully in the classic text-books of R. Watson-Jones, Trueta and others under the heading of "closed treatment of compound and infected fractures". Dr. King said that it appeared to him to be inviting trouble to risk such infections—for example, by opening a punctured wound of the thigh and plating a fracture of the femur because gross displacement had occurred. Thereby organisms that

might not respond to penicillin or streptomycin might be spread throughout the thigh. Dr. King thought it more prudent to treat grossly displaced compound fractures with external splinting at the start, and to try to obtain sound healing of the wound before considering operation for correction of displacements. Malunion or non-union was best dealt with surgically later in a non-infective field.

Referring to closed fractures, Dr. King said that some surgeons operated when there was only slight displacement, and many unnecessary operations were performed. So long as the shafts united with good alignment and no angulation, lateral displacements were not important. If the shaft of the femur was exposed and a five inch by seven inch plate inserted, the incision should be twice the length of the plate; and that wide injury to muscle planes resulted in adherent muscles and a much stiffer knee than followed external splinting. The Küntscher nail was useful for patients who were unsuitable for treatment by external splinting, if the fracture was transverse and in the middle third of the femur; early knee movements were then possible. The medullary cavities in the fragments of an oblique fracture of the tibia should be brought together by one or two screws if displacement had occurred. Plates should not be placed in the subcutaneous surface, as they caused irritation and breaking down of the wound; but even when they were put on the lateral or posterior surfaces, they were not always free from trouble. Most fractures of the radius and ulna, especially a single fracture of the radius, and the ulna in a Monteggia fracture, required internal fixation. The fractured humerus required operation only if gross displacement had occurred.

DR. G. DOUGLAS (Brisbane) said that surely the essential thing in the treatment of compound fractures was to obtain primary wound healing, and that anything else was a criminal offence.

DR. T. U. LEY (Townsville, Queensland) said that he had found the immediate plating of compound fractures not to be a success.

DR. H. R. H. BEATTIE (Tamworth, New South Wales) said that, although he could produce no statistics to support his statement, he thought that internal fixation of fractures produced better results than conservative treatment.

DR. J. R. S. LAHZ (Brisbane) urged those surgeons who strongly supported the open reduction and internal fixation of fractures (which could perhaps be treated by orthodox external splinting) to consider the position of their students, who would later be obliged to use the conservative measure. Dr. Lahz said that at the age of fourteen years he had sustained a simple fracture of the femur with about three inches of overlapping. An eminent surgeon had eliminated that degree of shortening by excision of the bone ends and had then "plated" the fracture. Since then Dr. Lahz had had sixteen operations for recurrent acute osteomyelitis, and now walked with a limp.

DR. A. V. MEEHAN (Brisbane) agreed with what had been said about bone grafting in the treatment of recent fractures, when operation was essential, and said that he obtained the bone from the cancellous or spongiosa bone in the upper end of the tibia.

DR. J. J. WOODWARD (Melbourne) described the horrors of conservative or non-operative treatment of recent fractures, and their avoidance by the increasing use of operative treatment in nearly every case of recent fracture.

DR. T. V. STUBBS BROWN (Brisbane) asked why there had been such an increase in the operative treatment of lower extremity fractures in the last few years. He said that skeletal traction still eliminated the need for some of those operations, and thought that the pendulum should not be allowed to swing too far towards operation.

DR. J. KENNEDY (Melbourne) thought that delayed union was the result of the present policy of "plating" fractures.

DR. LENNOX TEECE (Sydney) said that he agreed with Dr. Kennedy, that the present phase, one in which operation was almost demanded in the treatment of fractures, was the cause of delayed union, a preeminent problem at the present time.

Osteitis Deformans and Glucose Metabolism.

DR. MAX LAKE (Brisbane) discussed Paget's disease of bone from four points of view: (i) glucose metabolism, (ii) incidence in Australia, (iii) the dangers of immobilization and (iv) sarcoma. With regard to (i), he said that latent or mild glucose intolerance occurred in certain patients suffering from *osteitis deformans*. Of 140 patients suffering from Paget's disease at the Brisbane General Hospital from 1943 to 1949, 2% were suffering from diabetes. In 10 further cases three further "diabetics" were found, who formed the basis for the paper being presented. Dr. Lake said that the diabetes had paralleled the severity of the Paget's disease. The administration of adrenal cortical extract had increased the glucose intolerance and raised the serum phosphatase level. Dr. Lake presented the hypothesis that the glucose metabolic disorder was connected with the adrenal cortical control of phosphorylation, possibly by a direct effect on the serum phosphatase level. The only active therapeutic measure necessary was restriction of the diet to 1600 Calories per day. Dr. Lake then presented figures concerning the incidence of *osteitis deformans* (ii) in various hospitals in England, the United States and Australia. He pointed out that there were "variables" in the records. The conclusion that emerged was that *osteitis deformans* was probably more frequent in Australia than in most countries where detailed records were available. No significant disparity was found in the incidence in large hospitals in different States of Australia. Turning to (iii), Dr. Lake said that immobilization of a patient suffering from *osteitis deformans* might lead to serious results; the danger was greatest in fracture, but might complicate all conditions requiring immobilization of the patient. Immobilization, if enforced for long periods, led to increased calcium excretion due to the relative increase of bone absorption. In the active stage of Paget's disease the effects of that process were exaggerated by the rapid turnover of bone tissue, and large amounts of calcium circulated and in some cases were inadequately excreted, with the production of renal calculi, uræmia, metastatic calcification and death. The three main principles in treatment were: (*a*) The patient should move as much as possible, even in bed, and be allowed up as early as possible. (*b*) The intake of fluids by these elderly patients should be encouraged. (*c*) Foods rich in calcium were avoided during periods in bed, and vitamin *D* should not be given. Referring to (iv), Dr. Lake said that Paget's sarcoma of bone was highly malignant. The incidence was probably less than 2%; 98 cases had been reported, and he proposed to add another, making a total of eight from the Brisbane General Hospital. He gave brief details of his new case, and went on to discuss the pathology, diagnosis and treatment. With regard to diagnosis, he said that it rested on four pillars—clinical, radiological, biochemical and operative. Clinically, any patient with Paget's disease who had an increase of bone pain, or local bony swelling, or who had recently suffered trauma, should be placed under close observation. Radiologically, any localized area of rarefaction or sclerosis in a bone affected by Paget's disease should be regarded with suspicion; it should be remembered that a gumma occurring in syphilitic osteitis might be confused with Paget's sarcoma. Biochemically, the serum alkaline phosphatase level was frequently raised in *osteitis deformans*, and especially when sarcoma was a complication; the acid phosphatase level was never raised then. If there was any doubt after repeated clinical, biochemical and radiological examination, biopsy should be performed. Finally Dr. Lake said that immediate amputation appeared to be the best method of treatment. The data on the effectiveness of radiotherapy were meagre.

DR. B. G. WADE (Sydney) discussed the known effect of ultra-violet light and the formation of vitamin D. He did not think that ultra-violet light could cause vitamin *D*

to be formed and harm patients suffering from Paget's disease by causing excessive calcium formation in the affected bone.

DR. J. R. S. LAHZ (Brisbane) quoted four instances of familial Paget's disease; in one family five members were afflicted. Dr. Lahz said that that brought up the question of what was the common factor.

The Stiff Shoulder.

DR. LEIGH T. WEDLICK (Melbourne) read a paper on the stiff shoulder. He said that in acute cases stiffness was due to pain and spasm. Fractures and dislocations were detected by X-ray examination, and mobilization was begun as soon as possible. Arthritis, relatively uncommon, was characterized by pain, with limitation of movement in all directions. X-ray examination might aid diagnosis. Treatment consisted of rest and the application of heat until the acuteness subsided. Fibrositis was a common cause, and might be rheumatic or traumatic. The injection of "Novocain", application of heat, massage, and active exercise resulted in a rapid recovery.

Acute fulminating bursitis had an acute progressive onset, with severe pain on any attempt at movement, and acute localized tenderness beneath the acromion. Complete rest, with daily anodal galvanism, or the use of an ice bag, produced considerable relief within forty-eight hours. As acuteness subsided graduated movements were commenced.

Tendinitis, with or without trauma, might be acute or chronic. It was characterized by local tenderness, a "catch pain", and weakness in abduction. Dawborn's sign was often present. "Novocain" injection, with penetrating heat, and the avoidance of strain gradually effected a cure in four to eight weeks. Mobility was retained by active movements. X-ray therapy might help. Calcification was detected by X-ray examination; and in such cases X-ray therapy was particularly effective.

The chronic stiff shoulder was usually due to periarthritis. It occurred as the result of any painful shoulder condition, or of disuse as in hemiplegia or fracture. Short-wave therapy, massage and active exercise were given three times a week, and the range of movement was charted each week. The patient should be driven to persist with active exercise despite pain; on his cooperation the final result depended. Analgesic drugs and heat at home were used to alleviate pain, and a good result was usually obtained in about two months or so. Manipulation under general anæsthesia was considered (*a*) if after four to six weeks there was no increase in range of movement, and (*b*) if movement remained stationary at any stage. In all cases manipulation was immediately followed up with physical therapy. It was best avoided if concurrent osteoarthritic changes were present. X-ray therapy was useful in cases of severe and persistent pain.

Osteoarthritis of the shoulder was not uncommon as a cause of chronic stiff shoulder. The treatment was similar, but was usually necessary for several months, and relief might not be complete. The most common site was the acromio-clavicular joint; at the glenoid cavity it was fortunately rare, as in this situation it was often refractory to treatment. X-ray therapy sometimes was a help.

The most common type of stiff shoulder was therefore periarthritis, and the most valuable treatment was prevention. "A movement a day keeps adhesions away."

DR. A. O. GREEN (Goondiwindi, Queensland) advised treatment by repeated manipulations.

DR. J. HOETS (Sydney) said that he had known shoulder stiffness to follow gall-bladder disease and sea-sickness. He thought that in the latter instance the repeated leaning on one side was the traumatic factor. Dr. Hoets considered that intraarticular adhesions were important.

DR. F. MAY (Melbourne) advised deep X-ray therapy for some of the affected patients, although he was a practitioner of physical medicine.

Dr. Wedlick, in reply, said that numerous post-mortem examinations had been performed on patients who had died from other causes and who had had frozen shoulders, and in those cases the adhesions were extraarticular. He could supply no authorities for that statement. Dr. Wedlick said that in the treatment of his last 100 patients with stiff shoulders he had resorted to manipulation in four cases only.

Clinical Meetings.

Two clinical meetings of the Section of Orthopædics and Physical Medicine were held, one at the Brisbane General Hospital and the other at the Mater Misericordiæ Hospital.

Section of Medical Literature and History.[1]

President: W. L. Crowther, D.S.O., V.D., M.B., B.S., F.R.A.C.P., Tasmania.
Vice-Presidents: K. S. M. Brown, M.B., Ch.M., New South Wales; H. Boyd Graham, D.S.O., M.C., M.D., B.S., F.R.A.C.P., Victoria; L. P. Winterbotham, M.B., B.S., Queensland.
Honorary Secretary: G. Murphy, M.D., B.S., M.R.C.P., M.R.A.C.P., Queensland.

President's Address.

DR. W. L. CROWTHER (Hobart), in his presidential address, spoke of certain aspects of medical practice in Tasmania as experienced by members of his family. The period covered was just over a century and a quarter. Dr. Crowther described in some detail the experiences of William Crowther, M.R.C.S. (1788 to 1839), from his landing at Hobart Town on January 24, 1825, to his death on Christmas Day, 1839. His association with the movement for a free Press, for trial by jury and for encouragement of immigration was mentioned, and stress was laid on his efforts for the medical education of pupils at the Colonial Hospital. In the limited time available the education of his son, William Lodewyk Crowther, F.R.C.S. (1817 to 1885), was detailed, as well as the formation of a collection of natural history specimens, by the sale of which he completed his medical education at Saint Thomas's Hospital and the *Hôtel Dieu* at Paris. Consideration was given to his shipping ventures, trading with San Francisco, Valparaiso and the South Island of New Zealand, as well as a fleet on the high heas for guano and whale oil. Dr. W. L. Crowther said that time did not permit consideration of the political career of William Lodewyk Crowther nor of that of his son Edward Lodewyk Crowther (1843 to 1932), which carried on his humanitarian and political tradition. Dr. Crowther thought that mention of events subsequent to that date would be of no particular interest to the contemporary members of the medical profession.

Stones: Precious and Pathological.

DR. R. S. ELLERY (Melbourne) read a paper on stones, precious and pathological. He said that man's acquaintance with stones belonged to his beginning. He shaped his early

[1] The meeting held by the Section of Medical Literature and History with the Section of Medicine has been recorded.

implements from them and prized some for their colour or shape. In his animistic belief he credited some stones with magical properties, and certain of them were associated with healing. Dr. Ellery discussed those precious and semi-precious stones in relation to various diseases. Stones played a prominent part in early phallic worship and were concerned with the growth and production of food. Many of man's later customs and superstitions were linked with stones. Stones within the body (pathological stones) had troubled men as far back as history shed its light. The operation of lithotomy was of considerable antiquity. Dr. Ellery referred to peculiar stones and concretions occurring in outlandish places, and in conclusion mentioned the milestones which marked the progress of medicine.

The Practice of Medicine in Sydney and New South Wales Between 1880 and 1900.

A paper by DR. ROBERT SCOT SKIRVING, of Sydney, was read in his absence. He made reference to the hospitals in Sydney and the formation of the school of medicine in the University of Sydney and then dealt with the Prince Alfred Hospital and its founders. Dr. Skirving then mentioned some doctors of New South Wales, "old and not so old". He described some methods and techniques commonly in vogue in the 1880's and mentioned the appearance of specialists. He told many stories of men and events, referred to quackery, discussed the early performance of deliberate appendicectomy, and mentioned the South African War and its effects.

The Literary and Historical Aspects of the Writings of William Osler.

A paper by PROFESSOR WILLIAM WHITE, of Wayne University, Detroit, Michigan, United States of America, was read. The title of the paper was: "The Literary and Historical Aspects of the Writings of Sir William Osler."

Mosquito Control in Toowoomba.

DR. T. A. PRICE (Toowoomba, Queensland) said that for many years up to 1917 mosquitoes had been very prevalent in Toowoomba. They had caused much annoyance, loss of sleep and disease; seven epidemics of dengue fever had occurred in 1905 and 1915. As an alderman of the City Council, Dr. Price had had the opportunity of beginning a mosquito control campaign from 1916. By 1919 it had been so successful that for over thirty years since then few people had had to use nets. At the present time few households and no hotels possessed nets. In 1916 far-sighted State Government legislation had given all local authorities in Queensland full powers to enforce observance of mosquito control measures. Dr. Price went on to describe four other important features of the campaign: (i) The education of the public and of school children by means of lantern lectures. A special feature was a tank slide, which threw on the screen the picture of living mosquito larvæ swimming in the water, and the lethal effect of a drop of kerosene. Articles in the Press and notices on the picture-show screens were also used. (ii) Systematic inspection by well-trained inspectors to eliminate breeding places. (iii) Regular spraying of creeks and swamps. (iv) Attention to vases and other containers of flowers in the cemetery. Dr. Price said that the main difficulty had been the education of the public. It was necessary to convince people that mosquito control was possible, that it cost less than mosquito nets, and that it prevented much disease. In their daily work among their patients, his medical colleagues had been of great assistance. Since 1920 no candidate for election to the City Council would have a chance if he did not advocate active mosquito control. Mosquito control had not been successful elsewhere in Queensland. Consequently Toowoomba had occasional invasions of mosquitoes from adjoining communities; but householders quickly reported their arrival to the City Inspector, and he immediately dealt with the visitors. Dr. Price then put the question, who should receive the credit for the success in Toowoomba? He said that the answer was firstly Ronald Ross, that great scientist, whose years of toil had revealed that mosquitoes were the carriers of malaria, and secondly the people of Toowoomba, whose cooperation had been splendid, the medical profession, and the mayors and other members of the City Council.

Section of Radiology and Radiotherapy.[1]

President: E. W. Frecker, M.B., Ch.M., M.R.C.P., M.R.A.C.P., F.F.R., New South Wales.
Vice-Presidents: A. G. S. Cooper, M.B., Ch.M., D.M.R., Queensland; R. D. McIntosh, B.A., M.B., B.S., Tasmania; W. G. Rich, M.B., Ch.B., D.M.R.E., New Zealand.
Honorary Secretary: H. Masel, M.B., B.S., D.R., Queensland.

President's Address.

DR. E. W. FRECKER (Sydney) took as the subject of his presidential address "The Integration of Radiology with Clinical Medicine". He said that special skills, special aptitudes and special vocations were the basis of efficiency; but it had to be remembered that the limitation of special duties to individuals or groups of individuals necessarily promoted a great degree of interdependence between specialized groups. On the other hand, specially endowed groups tended to develop an independence of thought and outlook peculiar to their own aims and vested interests, which intellectually at least drove the groups apart; the result was discord, wasted effort and difficulty in mutual understanding and tolerance. It should also be remembered that specialization in its broadest sense promoted on the whole more leisure; effort was centralized and not dispersed. Dr. Frecker contended that radiology, considered as a special profession, had so far failed to adapt itself fully to the modern practice of medicine. Its technical efficiency was great and increasing; but there was a failure to realize that radiology was ancillary to general medicine and for ever dependent on the clinician and on clinical medicine for its virtues. Unlike other specialties, the scope of radiology was universal and its findings were of overwhelming importance to every practising physician. But the glamour of the X-ray procedure had been transferred falsely to the X-ray conclusion; radiology was held to furnish independent short-cuts to diagnosis, by-passing the older methods. Actually the X-ray fact had far less importance than the fact derived by common observation; the only criterion of value was that of diagnostic worth. "Radiological diagnosis" was an ill-conceived term; there could be no true diagnosis based on one class of facts. Dr. Frecker went on to describe the essential factors in an accurate diagnosis—a careful history, observation, pal-

[1] The meetings held by the Section of Radiology and Radiotherapy with the Section of Oto-Rhino-Laryngology, with the Section of Medicine and the Section of Public Health, Tuberculosis, Tropical Medicine and Industrial Medicine, and with the Section of Neurology and Psychiatry, have been recorded.

pation, percussion and auscultation, any special procedures, instrumental methods, pathological and biochemical tests, X-ray examination and so on. The more complete the examination, the greater the collection of data and the more likely a correct diagnosis. He then discussed some points in diagnosis and pointed out how radiological examination could be of great help, but should never be regarded as alone establishing the diagnosis. Fortunately for the specialty, radiologists were necessary to other branches of the medical profession and closely pursued by them; radiological extravagance and pretensions were checked on the operating table and in the post-mortem room and the pathological laboratory. Far from being humiliating, such a situation established radiology in a glorious tradition of service, by which it could make a grand contribution to clinical practice and progress. Dr. Frecker said that three facts should be recognized. First, radiologists had no exclusive claim to the use of X rays, and the only thing they should combat was the improper use of X rays by those insufficiently instructed. Secondly, diagnosis was predominantly clinical, and when the regional specialist desired to produce his X-ray films himself he always had the advantage of the professed general radiologist. Thirdly, such inroads upon radiology were strictly limited by their expensive and time-consuming nature; the busy specialist in the long run was glad to cast the technical burden upon the professed radiologist, and would fail to do so only when the radiologist failed to keep himself informed on the particular specialty concerned. Dr. Frecker then discussed technical considerations and drew attention to the limitations of the film alone and to the necessity for mature clinical judgement and for cooperation between the clinician and the radiologist. In making his report the radiologist was entitled to act as full physician consultant, speaking his mind as the spirit moved; but the usual etiquette and ethics of consultation should be observed—the report was "strictly personal" to the referring clinician. The medical profession as a whole thought little of the radiologist as a clinician, but rather regarded him as a super-technician. Every effort should be made to change that impression. In the first place, the name of the specialty might be changed to "clinical radiology" from "diagnostic radiology". Clinicians should be specially invited to attend radiological meetings; radiologists should appreciate the value of attending special clinical symposia and seminars. Dr. Frecker referred to the formation of the College of Radiologists (Aust. and N.Z.) and the part that it might play and to the need for the establishment of a chair of radiology at the University of Sydney. But the main action to be taken was not an action at all—a change of viewpoint in all parties concerned.

DR. A. ROBERTSON (Brisbane) stated that fault lay more with the practising physicians than with the radiologists. He personally liked to receive a long descriptive X-ray report with a differential diagnosis.

DR. J. COLCLOUGH (Sydney) said that if the ideas expressed by Dr. Frecker were to be put into practice many more radiologists would be needed in Australia, especially in the hospitals. At present radiologists were overloaded with work, and spot diagnosis of great rapidity was necessary in hospital practice.

DR. V. J. KINSELLA (Sydney) supported the statement that the radiologist, when in doubt, should tell the truth and not be afraid to say that he did not know the cause of an abnormal appearance on a film. He also stressed the importance of humility in all specialties.

DR. H. FLECKER (Cairns, Queensland) expressed appreciation of the idea that an X-ray examination was a clinical examination and a supplement to enable the diagnosis to be completed. He deprecated the way in which patients were referred for a specific series of films without the statement of a clinical problem. He also said that radiology should be integrated with anatomy and physiology more fully than in the past. Normal radiological appearances were still not fully understood.

DR. S. C. SEN (India) praised the language and breadth of view exhibited in Dr. Frecker's paper, but said that sometimes an X-ray diagnosis could be final and complete. He instanced certain positive findings, such as ulcer and fracture. The physician was at a considerable advantage in that he saw the patients. The radiologist might never see the patient. That was a drawback to the radiologist's becoming a clinician. He supported Dr. Colclough's statement about a shortage of radiologists and said that unless and until all patients entering an X-ray department were seen by a radiologist Dr. Frecker's ideals would not be attained. The practice of itinerant radiology from hospital to hospital, giving reports at each, was a bad thing. Radiologists should take time to visit the post-mortem room. Close cooperation was necessary and a daily routine of visits to the X-ray department by physicians, surgeons and specialists was much to be desired. At these visits cases could be discussed with the radiologists.

DR. W. POOK (Lismore) said that in the country practice of radiology cooperation was easier and that at Lismore meetings were held once a fortnight.

DR. G. W. MASON (Brisbane) stressed the need for cooperation and the provision of clinical notes.

Dr. Frecker, in reply, thanked the meeting for receiving the address in such a kindly fashion and stressed the point that the radiologist did not need to give a definite statement on every film. The present honorary system was not well adapted to such cooperation as that mentioned by Dr. Sen. He agreed that more radiologists were needed. Economic changes in the future were likely to send more men into hospital practice on a salaried or part-time basis. If radiology was to survive as a separate specialty a more clinical approach should be encouraged.

The X-Ray Diagnosis of the "Chronic Appendix".

DR. W. G. RICH (Christchurch, New Zealand) read a paper on the X-ray diagnosis of chronic appendicitis and gave an account of a series of cases in which the diagnosis had been obscured by unusual signs and symptoms. Dr. Rich said that in those cases the X-ray investigations either had been totally omitted or had been inadequate; otherwise the diagnosis would have been made much earlier. It was important to have some appreciation of the abnormal conditions which might be present if a proper assessment was to be made of the various abnormal X-ray signs observed in the appendiceal region. (i) The mucosa might be in a chronic catarrhal state; if it was œdematous the lumen would be narrowed. (ii) Repeated attacks of inflammation resulted in mucosal catarrh and caused fibrosis of the submucous and muscular coats, with consequent narrowing of the lumen and lessening of peristalsis. (iii) Stasis of the appendiceal contents from such stenosis might result in the formation of fæcal concretions, which in turn might cause further inflammatory attacks. (iv) The peritoneal coat might become inflamed, and as a result the appendix might become adherent to adjacent structures. Dr. Rich went on to describe the X-ray technique of examination, and to discuss the interpretation of the various findings. Referring to the varying symptomatology, he said that one symptom stood out predominantly—the presence of flatus, which might be regurgitated by mouth or passed *per rectum*. The next most common symptom was abdominal discomfort, unrelated to food, which might appear when the patient bent over after a meal; pressure from clothing might cause irritation. General debility was another common feature. Rarer symptoms included dizziness after moving and standing, pain over the heart and attacks of fever. One young girl had attacks of screaming at night, accompanied by sleep-walking; the attacks stopped after the removal of a chronically inflamed appendix. It was usually desirable to have a Graham's test performed, to determine whether the gall-bladder was diseased. Dr. Rich said that nowadays, by means of X rays, the chronically inflamed appendix could be located and diagnosed with almost complete accuracy.

The Trade Exhibition.

THE TRADE EXHIBITION COMMITTEE had at its disposal a considerable area on the first and second floors of the Geology and Engineering Building. Space was allotted to a number of commercial houses. The following is a short account of the several exhibits.

NICHOLAS PROPRIETARY, LIMITED (ETHICAL DIVISION), had a display of vitamin preparations, "Salacrin" (the Australian antibacterial), and selected sulphonamides. The reformulation of "Penta-vite" infant and adult formulæ multi-vitamin concentrates was emphasized by a display designed for quick appreciation of the salient features. This exhibit illustrated clearly the value of the balanced formulæ and water-miscibility of "Penta-vite", important factors in the rational administration of vitamins. "Aktavite", "Tabvita" and "Intravite" *B* group, "Calvita", "Potantol" and "Ungvita" were among the other Nicholas ethical specialties displayed.

STANFORD X-RAY COMPANY (PROPRIETARY, LIMITED, showed the following electro-medical and scientific apparatus: (*a*) Stanford 20 OMS four-valve fully rectified X-ray apparatus. The control of this equipment was greatly simplified by the use of the monitor control, which, accompanied by block milliamperage stabilization and direct reading kilovolt meter, made the equipment very efficient. (*b*) Stanford Ward model 85/30 shockproof mobile X-ray generator. (*c*) Liebel Flarsheim U.S.A. SW227 frequency controlled short-wave therapy unit, designed to function without the need of a screened cubicle. (*d*) Liebel Flarsheim U.S.A. Bovie electro-surgical apparatus designed for cutting and coagulation. (*e*) Stanford infra-red lamps, Bristow coil, ultra-violet lamp, X-ray illuminators and X-ray accessories. Much interest was shown in the Leitz optical products on display, which included the following: Leitz Panphot microscope, microtomes, Leica minature camera with accessories, Parvo projector, Leitz 35 millimetre enlarger.

BAYER PHARMA PROPRIETARY, LIMITED, included in their exhibit a special section dealing with antiseptics. The usefulness of "Zephiran" in all phases of surgical practice was demonstrated: from the pre-operative "scrub-up" to the final painting of the sutured wound, from the eye clinic to the delivery room. The value of this modern antiseptic was shown also for gross disinfection of hospital utensils, operating tables, wards *et cetera* and for the sterile storage of surgical instruments. A huge carboy showed the great volume of antiseptic made from a small measure of "Zephiran" concentrate. For the treatment of established infection in wounds "Monacrin" and "Neomonacrin Cream" were displayed. Amongst other products were "Franol", a new preparation for asthma, and, of some interest to travelling doctors, "T.S.R.", a travel sickness remedy well known overseas. Tropical medicines were on display, particularly "Aralen" (chloroquine), the new antimalarial.

ABBOTT LABORATORIES (AUSTRALIA) PROPRIETARY, LIMITED, had an exhibit the main feature of which was the new "Aerohaler" device for the inhalation of penicillin powder in upper and lower respiratory tract infections. Thenylene hydrochloride tablets, a new antihistaminic drug, and Abbott's "Dulcets" of sulphadiazine and "Duozine" also attracted much attention.

PARKE, DAVIS AND COMPANY showed new products which had recently emanated from their Research Division. Foremost amongst these was "Chloromycetin". This antibiotic comes to the ranks of those drugs which have so markedly extended the range of modern disease-fighting techniques. It was pointed out that "Chloromycetin" has several advantages not possessed by its predecessors; it is active against a specific group of disease-causing organisms not touched by penicillin or streptomycin. "Oxycel" is an entirely new departure in the way of hæmostatics, a preparation which not only causes a clot to be formed, but which can be left within the body and is absorbed in the fluid surrounding the tissues. "Benadryl", an antihistamine preparation for the treatment of allergy, was also shown. Included also were "Abdec" drops, an aqueous solution and multivitamin preparation consisting of eight vitamins, and other preparations.

ELI LILLY AND COMPANY, LIMITED, of Basingstoke, England, had on display most of their ethical proprietary preparations which are on the market in Australia. The most important of these was their complete range of the barbiturates, namely: "Amytal" tablets, "Sodium Amytal" pulvules, "Seconal Sodium" pulvules and "Tuinal" pulvules. Their liver products included ampoules "Reticulogen", ampoules "Liver Crude", "Lextron", "Lextron Ferrous" and "Extralin". "Merthiolate", an organic mercurial germicide, fungicide, antiseptic and preservative, was displayed in almost all its different combinations. "Amesec" pulvules and "Monotheamin" pulvules were of interest to those searching for new products for their allergic patients. "Entoral" pulvules, for oral immunization against the secondary invaders of the common cold, were shown. The following products also were included in the display: "Pectocel", pectin and kaolin compound, indicated in bacillary dysentery and non-specific diarrhœas; "Homicebrin", homogenized vitamins *A*, *B*, B_2, *C* and *D*, a palatable liquid product for the prophylaxis or treatment of multiple vitamin deficiencies in infants and children; "Tuamine Sulphate", a vasoconstrictor without secondary vasodilatation.

BURROUGHS WELLCOME AND COMPANY (AUSTRALIA), LIMITED, featured several products in their display of ethical pharmaceutical preparations, of which the following were of outstanding interest. "Physeptone" brand d1-2-dimethylamino-4:4-diphenylheptane-5-one hydrochloride was a synthetic compound of established value for the relief of severe pain. Equal to morphine in analgesic effectiveness, it is held to possess numerous advantages over that substance. "Neo-Epinine" brand isopropyl-nor-adrenaline sulphate is a new compound for the treatment of asthma and is relatively free from the undesirable side-effects of adrenaline. It may be administered sublingually or by oral inhalation. Globin insulin, "Wellcome" brand (globin insulin with zinc was originated in the Wellcome laboratories) has an effect intermediate between the quick action of unmodified insulin and the prolonged action of protamine zinc insulin. "Tubarine" brand injection of d-tubocurarine chloride is an effective curarizing agent of constant activity for use in surgery and as an adjunct to convulsion therapy. "Digoxin" (Burroughs Wellcome and Company) is widely accepted as a satisfactory digitalis preparation. "Methedrine" brand d-N-methylamphetamine hydrochloride was held to be of value both as a cerebral stimulant in depressed states and as a vasopressor agent in surgery. Included in the exhibit also was a "Vita-vision" display.

TAYLORS ELLIOTTS PROPRIETARY, LIMITED, had an exhibit which comprised four sections, stands numbers 10, 11, 12, 13.

Stand 10 was devoted to a display of surgical and chemical apparatus and much interest was observed in an illuminated display of "Coldlite" instruments, the new types of "Record" pattern syringes with interchangeable barrels, research microscope, analytical balance and pH meter. Of particular interest was the outfit which has been designed for the use of the Flying Doctor Service of Australia. One of these will be dispatched to all outback centres and will be under the control of the Flying Doctor concerned.

Stand 11 was devoted to the medical specialties produced in Australia under the D.H.A. label, and products resulting from the research activities of Lederle Laboratories, United States of America, and Southon Laboratories, Limited, England. The D.H.A. preparations included

"Dimerzine" (a sulphathiazole-free combination of sulphonamides in tablet, troche and emulsion form), "Hepadyn" and "Hepadyn Fort." (pleasant oral liver preparations without and with iron), "Picalba" (a stainless crude-tar distillate ointment), paraffin-free lanolin, penicillin and procillin (procaine-penicillin G) preparations, "Angesil", "Aminophylline", "Alusorb", "Rutin" *et cetera*. Aureomycin, "Teropterin", "Folvite" (brand of folic acid) are products of Lederle Laboratories which aroused much interest. "Esoban" cream of calamine from Southon Laboratories had already been introduced and well received for dermatological use.

Stand 12 was occupied by MESSRS. T. J. SMITH AND NEPHEW, LIMITED, of Hull, England. The main motive employed on this stand was an enlarged photographic portrayal of "Elastoplast" bandaging technique for severe varicose ulcers. This photograph formed the background of the stand upon which was displayed the full range of "Elastoplast" bandages and plasters, "Viscopaste" and "Ichthopaste", "Elastoplast" extension plasters, "Jelonet" paraffin gauze dressings, "Elastocrepe" bandages, "Gypsona" plaster of Paris bandages, and, finally, the new waterproof "Elastoplast" dressings and plasters. This new type of dressings created considerable interest. It is generally accepted that there is a definite place for a totally waterproof type of dressing, and this new "Elastoplast" product fills this long-felt need. Other items in great demand were the "Elastoplast" and "Gypsona" techniques which Smith and Nephew issue *gratis* to the medical profession as a means of assisting in the correct application of their many products.

At Stand 13 the Medical and Pharmaceutical Manufacturing Division of the WOOLWICH-ELLIOTT CHEMICAL COMPANY PROPRIETARY, LIMITED, exhibited their anæsthetic ether (British Pharmacopœia), ethyl chloride, solvent ethers, and other products manufactured by them that were of interest to the medical profession. To blend in with their anæsthetics three portable anæsthetic machines were on display. The manufacture in Australia from local raw materials of anæsthetic ether (British Pharmacopœia) and ethyl chloride (British Pharmacopœia) was pioneered by this company over thirty years ago, and much patient and painstaking research has gone into the manufacture, storage and supply of these anæsthetics, to produce consistently the high standard of purity imposed by the exacting standard of the British Pharmacopœia of today.

ANGLO-AUSTRAL HEARING AID DISPENSARIES showed a range of radionic acoustical apparatus, including new selective amplified stethoscopes, which, it was stated, were likely to replace the present air conduction stethoscope, as well as aids for the deaf specially produced to medical specifications when required. This apparatus was produced under the supervision and direction of recognized and qualified British surgical technicians in Australian laboratories.

THE COMMONWEALTH INDUSTRIAL GASES, LIMITED, Alexandria, New South Wales, were represented by the medical section of their subsidiary, Commonwealth Industrial Gases (Queensland), Proprietary, Limited. Considerable interest was shown in the latest piece of overseas equipment for the resuscitation of the premature infant. This was the E. & J. "Resuscinette", incorporating the E. & J. Resuscitator-aspirator-inhalator, built in the form of a mobile crib. The infant is placed in a plastic hood, where it is resuscitated in an atmosphere of controlled heat and humidity. A counterpart of the "Resuscinette" is the portable resuscitator used by surf rescue clubs, ambulance officers and the mines rescue squads. A comprehensive range of apparatus for the administration of gaseous anæsthetics by inhalation included the "Centanaest", Britain's latest addition to this important field, produced by the British Oxygen Company, London. The Australian-made Commonwealth Industrial Gases apparatus afforded an opportunity to view the latest in equipment for the administration of oxygen therapy. A typical hospital oxygen piping installation complete with visual warning system typified the method by which oxygen can be available at the patient's bedside without the need for a cylinder of oxygen. From a centrally controlled manifold of cylinders in the basement of the hospital oxygen is piped to a point at the bedside and the flow of oxygen is adjusted by the nurse operating a simple handwheel.

F. H. FAULDING AND COMPANY, LIMITED, in their display gave special attention to the ease with which procaine penicillin can now be injected with the "Syrette". The "Syrette", a sterile, disposable, plastic syringe, contains one cubic centimetre of procaine penicillin injection (300,000 units). To give an injection the doctor merely removes the rubber cap from the butt of the "Syrette", affixes a standard 20 gauge intramuscular needle, places the plunger into the barrel of the syringe and injects the fluid. Other products displayed included "Pentone" capsules ("Pentobarbital Sodium", 1·5 grains), an hypnotic and pre-anæsthetic sedative; "Hypettes", a series of sterile solutions in 10 cubic centimetre rubber-capped vials, which included "Hypette Nabita", a solution of sodium bismuthyl tartrate for infective and rheumatoid arthritis; "Barrier Cream", a non-greasy emollient and ointment base which provides surgeons and nurses with an effective counter to the skin irritation produced by "scrubbing up".

MAY AND BAKER (AUSTRALIA) PROPRIETARY, LIMITED, exhibited a number of recently developed products, amongst which were the antihistaminic "Phenergan" as well as "Anthisan". "Anthisan" is recognized as a satisfactory antihistaminic for the symptomatic control of many disorders. "Phenergan" has a more powerful and prolonged action than "Anthisan"; it is indicated in refractory conditions requiring antihistamine therapy. Among other preparations evolved in the May and Baker Research Laboratories, prominence was given to one of the aromatic diamidines, "Propamidine". This was stated to be a valuable antibacterial agent, particularly for the treatment of burns, wounds and abrasions. A high degree of antibacterial activity, not adversely affected by the presence of tissue degradation products, is claimed for it. Also shown was the recently introduced suspension of "Sulphatriad" brand compound sulphonamide. This product was issued in order to meet the demand for a preparation which would be acceptable to children and other patients unable to swallow tablets easily. The X-ray contrast media in the May and Baker range were shown, interest centring upon the water-soluble "Viskiosol-6", which is employed in hystero-salpingography. Some of the May and Baker barbiturates and anæsthetics were also on view; amongst the latter was placed "Flaxedil", a new synthetic curarizing agent. "Flaxedil" is stated to have advantages over d-tubocurarine in that it is less likely to produce undesirable side-effects. Another point of interest is that the action of "Flaxedil" can be rapidly reversed by the injection of neostigmin or other cholinergic agents.

FREDERICK STEARNS AND COMPANY DIVISION OF STERLING DRUG, INCORPORATED, showed a number of new products that have been released recently by the Australian section of the Company. "Essenamine" and "Parenamine", protein concentrates for oral and parenteral administration, respectively, streptomycin for parenteral and topical application, and "Apolamine", a completely new preparation developed and clinically tested in Australia for relief of nausea and vomiting in pregnancy, were a few of the pharmaceuticals on display. Also exhibited was a completely new sulphonamide for topical application, effective against both Gram-positive and Gram-negative bacteria and also active in the presence of pus and blood which will shortly be available under the name "Sulphamar".

GLAXO LABORATORIES (AUSTRALIA) PROPRIETARY, LIMITED, presented their exhibits in seven vertical wall units each of which was used either to display products or to illustrate methods of manufacture or research. The principal unit was devoted to crystalline penicillin (Glaxo). Dry procaine penicillin and "Compropen", both of which are fortified by the addition of crystalline penicillin (Glaxo) to procaine penicillin, were included in this unit. Enlarged photographs of the Glaxo antibiotic plants in England illustrated the large increases in the scale of production of British streptomycin both as dihydrostreptomycin

sulphate (Glaxo) and streptomycin calcium chloride complex (Glaxo). The unit illustrating the original research carried out in the Glaxo Laboratories Research Division, which resulted in the isolation of the pure crystalline anti-anæmic factor (vitamin B_{12}) attracted considerable attention. "Cytamen", which contains the equivalent of 20 microgrammes of vitamin B_{12} per cubic centimetre, was included in this unit. The remaining units displayed a full range of Glaxo vaccines, anæsthetic agents, analgesics, X-ray media and vitamin products from "Adexolin" to "Permidin".

BOOTS PURE DRUG COMPANY (AUSTRALIA) PROPRIETARY, LIMITED, showed the range of their medical products covering anæsthetics, dermatology, gynæcology, hæmatology, radiography, psychiatry, surgery *et cetera*. Two new preparations were "Heparin Retard", a form of heparin for intramuscular use, and "A.V.C." tablets with "Flavazole" for the treatment of trichomonas and monilia infections. A colour chart for use with the urine test for sugar in diabetes was available. The penicillin preparations on display included the new procaine penicillin for aqueous suspension. Also shown were three products derived from war gases—"BAL" (British Anti-Lewisite) for metallic poisoning, "D.F.P." for glaucoma, paralytic ileus and *myasthenia gravis*, and nitrogen mustard for Hodgkin's disease *et cetera*.

ALLEN AND HANBURY (AUSTRALASIA), LIMITED, showed a wide range of stainless steel instruments manufactured in London. Operation tables were also shown. Medical products included the grouped preparations of penicillin, the most outstanding of which were penicillin chewing gum and penicillin "Nonad" tulle. The new curarizing agents were represented by "Eulissin" and its antidote "Antilusin", to which has recently been added "Eulissin P" for psychiatric treatment, and "Hexathide", a new drug having properties similar to "Antilusin" in that it blocks the ganglia of the autonomic system. Liver therapy was represented by "Hepolon", a sterile solution of all the known hæmatopoietic principles of whole liver, proteolysed liver (A. & H.) for oral administration in megalocytic anæmias, and "Anahepol", a highly concentrated solution of hæmopoietin. "Rutin" (A. & H.) has been proved useful in the treatment of hypertension, toxæmias of pregnancy, apoplexy, retinal hæmorrhage, glaucoma *et cetera*. A new product is now available in tablet form, combining "Rutin", phenobarbital and aminophyllin. A complete range of standard injection solutions was on show.

SURGICAL SUPPLIES, LIMITED, showed a wide range of orthopædic appliances, surgical belts and corsets, elastic hosiery, rupture appliances, surgical boots and other sick-room requisites. Surgical Supplies, Limited, are the Queensland distributors for Allen and Hanbury (Australasia), Limited.

RECKITT AND COLMAN (AUSTRALIA), LIMITED (Pharmaceutical Division), Sydney, showed "Dettol", which is a halogen derivative of xylenol dissolved in a mixture of aromatic essential oils. It is a clear light yellow fluid with a pleasant and agreeable aroma. "Dettol" is miscible with water in all proportions, forming a fine emulsion. It has a Rideal-Walker coefficient of 3 for *Bacillus typhosus*. It was stated that tests carried out by three independent investigators at well-known London hospitals to determine bactericidal efficiency in other directions had established that "Dettol" in the presence of 50% of serum, 50% of blood or 20% of natural pus was effective against *Staphylococcus aureus* and *Streptococcus pyogenes*. "Dettol" obstetric cream consists of 30% of "Dettol" in gum tragacanth, and is intended for disinfection of the patient's skin, the attendants' hands and gloved hands. It is water-soluble.

G.P. PROPRIETARY, LIMITED, presented a range of ethical specialty products including "Hepasol Compound" with and without strychnine, "Polyhæmen", "Multi-B", "BCM", "BCM with Phenobarbitone", "Neocal", "Codiphen", "Phenobrom", "Rectinol" ointment and suppositories, "Gynex" pessoids, together with a full range of vitamin and thyreoid tablets.

SIGMA COMPANY, LIMITED, of Melbourne, displayed their range of penicillin preparations and gave special prominence to the following recent additions: "Penicrin" powder (Sigma) containing 0·5% 5-amino-acridine hydrochloride and 2000 units of penicillin per gramme in a sterile sulphanilamide base; it is packed in a plastic tube which, when pierced, acts as an insufflator. "Penicrin" ointment (Sigma) containing 0·1% 5-amino-acridine hydrochloride and 500 units of penicillin in each gramme of anhydrous water-soluble base; both this ointment and the powder are active against a wide range of both Gram-positive and Gram-negative organisms. "Benzopen" lozenges (Sigma), a flavoured lozenge containing 1000 units of penicillin and one-third grain benzocaine per lozenge; the mild anæsthetic effect is an adjunct when treating painful mouth or throat infection caused by penicillin-sensitive organisms. Penicillin for inhalation (Sigma), a set issued to permit the extemporaneous dispensing of a fully potent solution for aerosol therapy. The "Deedon" inhaler for use by the patient was also shown. "Cilicaine" (Sigma), a new 400,000 unit single dose container presenting 300,000 units of procaine penicillin G with 100,000 units of crystalline sodium penicillin G, readily miscible with 2·0 millilitres of sterile water for intramuscular injection; it combines initial high blood levels with lower sustained levels.

OXYGENAIRE (AUSTRALIA) PROPRIETARY, LIMITED, designers and manufacturers of oxygen tents and oxygen therapy equipment, displayed a series of photographs illustrating their emergency service in operation, which, on instruction from the doctor, delivers, instals on hire and supervises equipment in the patient's home and in hospitals. A selection of their stock equipment was on view also, and many demonstrations were given. Included in the display were the Wigmore tents, which, operating on the principle of thermal convection, require no power, combining easy accessibility with clear vision of the patient for nursing staff, and maintaining high oxygen concentration at a relatively low litre-flow. The first Australian-manufactured Queen Charlotte tent for infants and premature babies was also displayed, together with the "Oxycillin" atomizer (also now manufactured in Australia) and the "Oxyair" lightweight plastic face mask.

KODAK (AUSTRALASIA) PROPRIETARY, LIMITED (Medical Division), covered in their display the radiographic and photographic apparatus supplied by them for use in the fields of modern medicine. The items shown included: "Kodak" blue brand X-ray film, the double-coated film that provides radiologists with radiographs of full diagnostic value; "Kodak" X-ray cassettes and X-ray exposure holders of modern design, ensuring efficiency in the handling and exposure of X-ray film; design of X-ray processing rooms; "Kodak" processing equipment, an extensive series of modern items of equipment ensuring complete provision of all that is necessary in the correct processing of X-ray films; equipment for clinical photography and cinematography. It was pointed out that the field of clinical photography, both still and motion pictures, black and white and in colour, was most extensive and its application was growing daily. "Kodak" equipment for visual education was exhibited—an extensive range of projection equipment of all modern types covering the requirements of this field.

THE CROOKES LABORATORIES, LIMITED (LONDON), had a display of material dispatched from London specially for the exhibition. The following exhibits, representing ethical lines marketed in the Commonwealth, were among those featured: "Auro-Calcium", a gold injection of low toxicity for the treatment of rheumatoid arthritis. "Neo-Ferrum", an effective colloidal iron in liquid or tablet form, for the treatment of microcytic anæmias; a special feature of this product was held by the manufacturers to be its freedom from causing gastro-intestinal upsets. "Collosol Manganese", one of the firm's earliest colloidal products, was said to have been used successfully in the treatment of furunculosis *et cetera* for over thirty years, the systemic effect being tonic and stimulating. "Collosol Iodine", given orally or parenterally for simple goitre, asthma, hypertension and rheumatism; it was stated to be absorbed

and eliminated gradually. Amongst other exhibits were Crookes's scalp lotion and lactocalamine lotion and vitamin charts and "trees".

JOHNSON AND JOHNSON PROPRIETARY, LIMITED, presented two new specialties which were of considerable interest. The first was "Bio-Sorb", a biologically absorbable surgeon's glove powder which has just been introduced in Australia after extensive research overseas. This powder has been developed to meet the requirements for a safe and efficient glove dusting powder. The second was "Hemo Pak", a hæmostatic gauze and cotton available in either form. A feature of these oxidized cotton products was stated to be that they are completely absorbable and have the tensile strength which is necessary in the packing of body cavities. The exhibit also covered the general range of the Company's products, including "Mersutures", "Ethicon" sutures, tantalum products, "Porowax", adhesive plasters, and a full range of surgical dressings.

PHILIPS ELECTRICAL INDUSTRIES (AUSTRALIA) PROPRIETARY, LIMITED, in their medical instruments display, included modern equipment embracing X-ray, short-wave, infra-red and ultra-violet therapy and cautery light transformer. An X-ray wall bracket unit for use in the surgery was an interesting feature of the X-ray section. A new range of Philips short-wave therapy apparatus included a *de luxe* floor model, mounted on smoothly-running ball-bearing castors. This model has specially hinged arms that allow the glass electrodes to be conveniently adjusted to any position. Philips "Biosol" ultra-violet units and Philips infra-red lamps featured many improvements; a floor model and a table model of each were shown. The electrocardiograph on display was claimed to be the first direct writing apparatus to be designed and manufactured in Australia. A special feature was its freedom from electrical interference, which often distorts the cardiogram. An exclusive circuit arrangement eliminated this distortion. Formerly, Philips produced a galvanic apparatus and a Bristow faradic apparatus, but the functions of these have now been incorporated into one unit known as the galvanic and faradic unit. As its names implies, cautery light apparatus supplies power to a lamp which the operator uses for close cavity inspection. This lamp was shown. The second output supplies current for a platignum cauterizing burner for removing skin blemishes, moles *et cetera*.

W. RAMSAY (SURGICAL) PROPRIETARY, LIMITED, showed medical and surgical text-books, including "Practitioner's Card Index to Treatment"; Beck microscopes, including the "Lomag" for fenestration operations; bronchoscopes, œsophagoscopes, laryngoscopes, general ear, nose and throat instruments; bone and general surgical instruments and examination lamps.

IMPERIAL CHEMICAL INDUSTRIES OF AUSTRALIA AND NEW ZEALAND had a display which illustrated in colour the use of four of the Company's products. "Sulphamezathine": The exhibit consisted of a dark background with a picture of kidneys, tubes and bladder painted in colour in a circular frame. "Trilene": A photograph was featured showing a woman in bed using an inhaler for obstetric purposes. "Penicillin": The exhibit consisted of a black background with four outline figures in red showing the relative absorption times of the various methods of administration. "Avloprocil": A large graph formed the background of the exhibit, giving the graphical comparison of blood levels over three days. Every display contained copy giving details of the products and their uses.

WATSON VICTOR, LIMITED, were represented by a display which included medical scientific apparatus, surgical, electro-medical and physiotherapy equipment, and a wide range of X-ray apparatus. The products displayed were of interest not only to the specialist but also to the general practitioner. In the scientific section one of the instruments was the Adam Hilger "Spekker" absorptiometer (a photo-electric colorimeter). This instrument is used for biochemical analysis and was claimed to be rapid and accurate and to eliminate personal error. Other instruments exhibited in this section were microscopes by Watsons, London; "Qualtex" thermostatically controlled incubators and apparatus for the pathological laboratory; pH meters; laboratory glassware; and the recently produced "WatVic Duoscope" (improved epidiascope). The X-ray section gave prominence to the "WatVic" SF-2 mobile X-ray apparatus, for use in the hospital ward or the practitioner's surgery. Of interest to physicians was the G.E. direct-writing "Cardioscribe" electrocardiograph. The feature of this instrument is the simplicity and ease of operation. Also displayed was a full range of film processing systems, cassettes, screens and other accessories which play a major part in the production of high-quality radiographs. The "WatVic" surgical instrument section featured the latest addition to their range—the "WatVic" "Rota" frame—certainly a credit to Australian craftmanship. This is a bed for nursing patients suffering from spinal and pelvic fractures, poliomyelitis, tuberculosis of the spine *et cetera*. The "Rota" frame allows one nurse to turn the patient in complete comfort—an operation normally requiring four nurses. The surgical section also exhibited a comprehensive range of instruments for surgeons, gynæcologists, urologists, and ophthalmic and orthopædic surgeons.

CIBA, LIMITED, of Basle, Switzerland, showed a range of hormones, antihistamines, antispasmodics, anæsthetics, hypnotics and sedatives and other pharmaceutical specialties.

ROCHE PRODUCTS, LIMITED, of Welwyn Garden City, England, introduced a new sedative and hypnotic under the trade-mark of "Persedon". Belonging neither to the barbiturates nor to the ureides, "Persedon" represents an entirely new type of hypnotic with certain advantages over both. It was stated that thorough pharmacological and clinical investigations had confirmed its efficacy. Its effect is rapid but not unduly prolonged, therefore "Persedon" can be taken during the night when only a few additional hours of sleep are required. "Persedon" is also one of the ingredients of the Roche analgesic, "Saridone", which is a fast-acting analgesic, free from disturbing side effects. The third edition of "Vitamins in Medical Practice" was shown. Among the more recent additions to the Roche vitamin preparations were "Ferro-Redoxon", a combination of iron and vitamin *C* indicated in a variety of anæmic states, and "Becosym", containing aneurin, riboflavin, nicotinamide, calcium pantothenate and pyridoxine, for oral administration.

Correspondence.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION): SEVENTH SESSION.

SIR: The Executive Committee desire to thank all those officers of Congress in all States who worked to make it a success, and also those who worked unofficially toward the same end.

Yours, etc.,

W. J. SAXTON,
Honorary General Secretary.

B.M.A. House,
225 Wickham Terrace,
Brisbane.
June 16, 1950.

A MORE REALISTIC VIEW OF TUBERCULOSIS.

SIR: Patients with slight, early lesions, found by routine skiagram, habitually respond favourably to hypodermic injections of tuberculin. Here is an example:

A nurse was submitted to radiological examination in 1939, 1940 and 1941 and nothing found.

In December, 1942, a routine skiagram showed patchy consolidation at the base of the right upper lobe and an apical pleural scar on the left side. Three radiologists, the hospital superintendent and a consultant diagnosed tuberculosis, and I concurred. She reacted to old tuberculin. She rested and received thirteen injections of old tuberculin, 0·0001 cubic centimetre up to 0·17 cubic centimetre, and then thirteen of bacillary emulsion, 0·00002 up to 0·002 cubic centimetre, the last on June 30, 1943. In June, 1950, she was robust and active and had been six years on duty.

In more advanced cases of tuberculosis the results are often, though, of course, not invariably, very good.

In THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1943, page 399, is reported the case of a hospital patient, Mrs. M.I.S., who in 1935 had chronic tuberculosis in each lung and tubercle bacilli in the sputum, and who did very well under tuberculin. In 1950 I met her by chance. She was a little lame from a spinal injury, but looked well, strong and stout. She said that her lungs were quite well.

Yours, etc.,

Sydney, July 4, 1950. GUY GRIFFITHS, M.D.

THE TOXICITY OF "P.A.S.".

SIR: I would like to utter a word of warning to those physicians who are using para-aminosalicylic acid ("P.A.S.") in the treatment of pulmonary tuberculosis. Very little has been published about the toxicity to humans of this drug, and the general impression has been that its most serious toxic effects are diarrhœa and nausea.

We have recently encountered a series of patients who have developed signs and symptoms of acute myocarditis while taking normal doses of "P.A.S.". Electrocardiograms on these and other patients who have received large total amounts of the drug without relevant symptoms tend so far to substantiate the existence of myocardial damage.

Whether this is caused by the "P.A.S." or an associated serum potassium or vitamin B_1 deficiency is still conjecture, but investigations are being carried out in this regard. I would like to stress, however, that there is a possibility of such a serious state emerging at a comparatively early date in "P.A.S." therapy.

Yours, etc.,

Chest Clinic, Royal Adelaide Hospital, Adelaide. July 3, 1950. R. MUNRO FORD.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Lectures in Obstetrics and Gynæcology for M.R.C.O.G. Candidates.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the course of lectures suitable for M.R.C.O.G. candidates will be resumed on Monday, August 14, 1950. The course will consist of six lectures in gynæcology by Dr. F. A. Maguire, to be given twice each week at 2.30 p.m., and will be followed by six lectures in obstetrics by Professor Bruce T. Mayes, given on the same days, at 4 p.m.

The fee for attendance is £6 6s., and those wishing to enrol are requested to communicate as soon as possible with the Course Secretary, the Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, from whom programmes may be obtained.

THE AUSTRALIAN POST-GRADUATE FEDERATION IN MEDICINE.

Positions as Ship's Surgeon for Post-Graduate Students.

THE Australian Post-Graduate Federation in Medicine wishes to announce that the P. and O. Company has agreed to make available each year to the Federation on cargo and other vessels a number of positions as ship's surgeon for medical graduates proceeding to the United Kingdom for post-graduate work or study.

The positions will be offered by the Federation in turn to each State Post-Graduate Committee, and it is expected

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JULY 8, 1950.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.[2]	Tasmania.	Northern Territory.[3]	Australian Capital Territory.	Australia.[3]
Ankylostomiasis	*	..	..	..	..	..	..	..	..
Anthrax	*	..	..	..	..	..	..	..	..
Beriberi	*	*	*	*	*	*	..	*	..
Bilharziasis	*	..	..	..	..	..	..	..	..
Cerebro-spinal Meningitis	1(1)	2(2)	1	1	..	3(2)	..	..	8
Cholera	..	..	..	..	..	..	..	..	..
Coastal Fever(*a*)	*	*	*	*	*	*	*	*	..
Dengue	*	*	*	*	*	*	..	*	..
Diarrhœa (Infantile)	..	..	..	..	..	..	..	..	..
Diphtheria	8(3)	5(5)	7(5)	..	..	..	..	..	20
Dysentery (Amœbic)	*	..	..	4(4)	..	..	..	..	4
Dysentery (Bacillary)	*	3(3)	..	..	..	1	..	2	6
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..
Erysipelas	*	*	*	..	*	*	..	..	..
Filariasis	*	..	..	..	..	..	..	..	..
Helminthiasis	*	..	*	*	*	*	*	*	..
Hydatid	*	..	*	*	..	*	*	..	..
Influenza	*	*	*	..	*	*	..	*	..
Lead Poisoning	*	*	..	*	*	*	*	*	..
Leprosy	..	..	..	..	..	..	..	..	..
Malaria(*b*)	*	..	1	..	..	..	..	..	1
Measles	*	*	*	107(50)	*	*	..	1	108
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	3(2)	2(1)	..	14(12)	*	*	*	*	19
Psittacosis	*	..	..	..	..	..	..	..	..
Puerperal Fever	..	..	..	1(1)	..	..	..	..	1
Rubella(*c*)	*	*	..	..	*	..	..	1	1
Scarlet Fever	18(13)	20(10)	7(3)	18(13)	..	8	..	3	74
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	*	..	2	*	*	*	*	*	2
Trachoma	*	..	*	*	*	*	*	*	..
Tuberculosis(*d*)	30(24)	26(20)	4(3)	13(13)	..	8(2)	..	..	81
Typhoid Fever(*e*)	..	1(1)	..	..	..	..	..	..	1
Typhus (Endemic)(*f*)	..	..	2(1)	1(1)	..	..	..	..	3
Undulant Fever	*	..	..	..	*	*	*	..	..
Weil's Disease(*g*)	*	*	..	..	*	*	*	5	..
Whooping Cough	*	*	*	(1)	*	*	..	..	2
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946-1947. Figures in parentheses are those for the metropolitan area.
[2] Figures not available.
[3] Figures incomplete owing to absence of returns from the Northern Territory and Western Australia.
* Not notifiable.
(*a*) Includes Mossman and Sarina fevers. (*b*) Mainly relapses among servicemen infected overseas. (*c*) Notifiable disease in Queensland in females aged over fourteen years. (*d*) Includes all forms. (*e*) Includes enteric fever, paratyphoid fevers and other Salmonella infections. (*f*) Includes scrub, murine and tick typhus. (*g*) Includes leptospiroses, Weil's and para-Weil's disease.

that one will be allotted to each State per year. The vacancies occur at comparatively short notice, and post-graduates anxious to be considered for these positions should register their names with the Post-Graduate Committee in the State in which they reside.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Flynn, Helen Patricia Livingstone, M.B., B.S., 1948 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Brown, Kenneth James, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Cahill, Michael Edward, provisional registration, 1950 (Univ. Sydney), Base Hospital, Wagga Wagga.

Grace, Frederick McGill, M.B., B.S., 1948 (Univ. Sydney), Prince Henry Hospital, Little Bay.

Hennessy, Edmund John, M.B., B.S., 1947 (Univ. Sydney), 190 Wollombi Road, Cessnock.

McLaughlin, Brian Luden Vardon, provisional registration, 1950 (Univ. Sydney), Mater Misericordiæ Hospital, Waratah.

Nevell, Thomas Franklin, M.B., 1946 (Univ. Sydney), 18 Churchill Crescent, Cammeray.

Twomey, Brian Maynard, provisional registration, 1950 (Univ. Sydney), Base Hospital, Wagga Wagga.

Obituary.

SYDNEY JOHN NEWING.

WE regret to announce the death of Dr. Sydney John Newing, which occurred on July 2, 1950, at Essendon, Victoria.

BEAUMARIS WILLIAM STEVENSON.

WE regret to announce the death of Dr. Beaumaris William Stevenson, which occurred on July 16, 1950, at Sydney.

Notice.

OPHTHALMOLOGICAL SOCIETY OF NEW SOUTH WALES.

A MEETING of the Ophthalmological Society of New South Wales will be held in the Stawell Hall of The Royal Australasian College of Physicians, 145 Macquarie Street, Sydney, on August 3, 1950, at 8 p.m. Professor Ida Mann will deliver an address entitled "Some Research Experiences". All medical practitioners are invited to be present.

LECTURE BY SIR HOWARD FLOREY.

THE University of Sydney announces that Sir Howard Florey will deliver a lecture in the Wallace Theatre, University of Sydney, on Monday, August 14, 1950, at 8 o'clock p.m. The subject of his lecture will be "Medical Research and the John Curtin Institute of Medical Research". All medical practitioners are invited to attend.

AN APPEAL FOR LEGACY.

SYDNEY LEGACY has a number of widows and wards who are anxious to obtain positions as doctors' receptionists. Some have had previous experience in this particular field and have excellent references. Sydney Legacy suggests that any doctor who has a vacancy should apply to it at Legacy House, 144 Castlereagh Street, Sydney, to see if he can help Legacy in the placing of those who need employment.

Diary for the Month.

AUG. 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
AUG. 2.—Victorian Branch, B.M.A.: Branch Meeting.
AUG. 2.—Western Australian Branch, B.M.A.: Council Meeting.
AUG. 3.—South Australian Branch, B.M.A.: Council Meeting.
AUG. 4.—Queensland Branch, B.M.A.: Branch Meeting.
AUG. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
AUG. 11.—Queensland Branch, B.M.A.: Council Meeting.
AUG. 14.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
AUG. 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 16.—Western Australian Branch, B.M.A.: General Meeting.
AUG. 17.—Victorian Branch, B.M.A.: Executive Meeting.
AUG. 22.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney)—All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £3 *per annum* within Australia and the British Commonwealth of Nations, and £4 10s. *per annum* within America and foreign countries, payable in advance.